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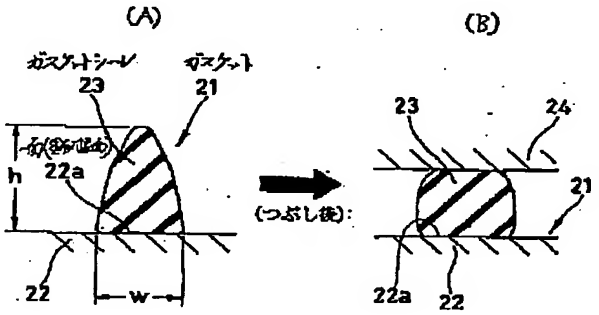
(54)【発明の名称】　ガスケット及びガスケットの製造方法

(57)【要約】
【課題】　ディスペンサシステムを用いてガスケットを製造する方法において、相手材までの高さが高い場合であってもガスケットシールの底辺を小さく設定することができ、もってシールの成形可能位置を広く確保することが可能であるとともに、シール成形材料の使用量を少なく抑えることが可能であり、ガスケット反力を小さく抑えることが可能であり、更にガスケット反力が位置によって大きくばらつくのを抑えることが可能なガスケットの製造方法を提供する。
【解決手段】　ニードルを備えたディスペンサシステムを用いて塗布対象面２２ａにガスケットシール材料を塗布することによってガスケット２１を製造する方法であって、ニードルの吐出口の開口形状を異形断面とすることにより成形後のガスケットシール２３の断面形状を、その高さをｈ、その最大幅をｗとして、ｈ／ｗ≧１とする。



【特許請求の範囲】

【請求項１】 ニードル（２）を備えたディスペンサシステム（１）を用いて塗布対象面（２２ａ）にガスケットシール成形材料（２３'）を塗布することによってガスケット（２１）を製造する方法であって、

前記ニードル（２）の吐出口（２ｂ）の開口形状を異形断面とすることにより成形後のガスケットシール（２３）の断面形状を、その高さをｈ、その最大幅をｗとして、ｈ／ｗ≧１とすることを特徴とするガスケットの製造方法。

【請求項２】 請求項１のガスケットの製造方法において、

ニードル（２）に後退角（α）を設定したものを用いることを特徴とするガスケットの製造方法。

【請求項３】 請求項１または２のガスケットの製造方法において、

ニードル（２）に塗布対象面（２２ａ）に対して平行方向および直角方向に移動するとともにその中心軸（０）を中心として回転作動するものを用いることを特徴とするガスケットの製造方法。

【請求項４】 ニードル（２）を備えたディスペンサシステム（１）を用いて塗布対象面（２２ａ）にガスケットシール成形材料（２３'）を塗布することによって製造されるガスケット（２１）であって、

成形後のガスケットシール（２３）の断面形状を、その高さをｈ、その最大幅をｗとして、ｈ／ｗ≧１としたことを特徴とするガスケット。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、密封装置の一種であるガスケットに係り、特に、ディスペンサシステムを用いて製造されるガスケットと、その製造方法とに関するものである。

【０００２】

【従来の技術】今日まで一般に、ディスペンサシステムによって製造されるガスケットは簡易的なガスケットであると考えられてきたが、その製造が容易なこと、および製造コストが安価なことから注目され、最近では、機能の拡大とともに関心が高まってきている。

【０００３】ここで、従来例として、このディスペンサシステムによって製造されるガスケット５１の概略構造を図１８（Ａ）に示すと、塗布対象面としてのガスケット基板５２の一面５２ａに液状のガスケットシール成形材料が塗布されることによってガスケット５１が成形されており、成形後のガスケットシール５３の断面形状は略半円形とされている。

【０００４】また、従来のディスペンサシステム５５におけるニードル５６は、図１９（Ａ）および（Ｂ）に示すように、その先端開口形状が円形であって、その先端部は後退角零のストレートとされており、またディスペンサシステム５５の制御方向すなわちニードル５６の作動方向は、図２０に示すように、塗布対象面２２ａに対する平行方向および直角方向（Ｘ－Ｙ－Ｚ方向）のみとされている。

【０００５】しかしながら、この従来のディスペンサシステム５５によって製造されるガスケット５１においては、上記したニードル５６の先端開口形状等からして、成形後におけるガスケットシール５３の断面形状が、その高さをｈ、その最大幅をｗとして、ｈ／ｗ＜１に限定されたものとなるために、

① 相手材までの高さが比較的高い場合に、ガスケットシール５３の底辺の長さが長くなってその幅が広くなることから、ガスケットシール５３の成形可能位置に制約が生じ、またガスケットシール５３の成形に必要とされる成形材料の量が多くなる、

② ガスケットシール５３の耐久性を向上させるべくその高さを高くすると、ガスケット５１の組込みに際して初期的にガスケット反力が高くなり、場合によっては、高くなり過ぎたガスケット反力によりガスケット基板５２が変形してしまうことがある、

③ ガスケットシール５３の平面形状がカーブまたは屈曲している部分ではその内周側と外周側とで長さが異なるために、断面形状がいびつになり易く、その結果として、ガスケット反力の大きさが平面位置により異なることになる、と云った不都合があり、これらの不都合を回避する方法として、

① 射出成形等の別の方法によりガスケットシール５３を成形する、

② 図１８（Ｂ）に示すように、ディスペンサを使用して、１回目に土台５３ａを成形し、２回目に上部５３ｂを成形し、すなわち二度塗りを行なう、と云った方法が考えられるが、何れの方法もコストがかかり、近年における要求機能を充分に満足することができない。

【０００６】また、これまでに、ニードルの先端形状に関して、円形断面・ストレートノズルの他に、ニードル内径を先細りにしたもの（特開昭６２－２５８７７６号公報または特開平９－２３９９７６号公報参照）や、ニードル先端に角度を設けたもの（特開平７－３１８７４７号公報参照）等が開発されているが、これらの従来技術は比較的低粘度の液体（３～３００ｃｐｏｉｓｅ）をディスペンサ塗布する際にニードルの詰まり防止や塗布量の安定化のために提案されたものであり、本発明のように成形後のガスケットシールの断面形状を、ｈ／ｗ≧１とするものではない。

【０００７】

【発明が解決しようとする課題】本発明は以上の点に鑑みて、ディスペンサシステムを用いてガスケットを製造する方法において、相手材までの高さが比較的高い場合であってもガスケットシールの底辺を比較的小さく設定することができ、もってガスケットシールの成形可能位

置を広く確保することが可能であるとともに、ガスケットシール成形材料の使用量を少なく抑えることが可能であり、ガスケット反力を小さく抑えることが可能であり、更にガスケット反力が位置によって大きくばらつくのを抑えることが可能なガスケットの製造方法と、この方法によって製造されるガスケットとを提供することを目的とする。

【０００８】

【課題を解決するための手段】上記目的を達成するため、本発明の請求項１によるガスケットの製造方法は、ニードルを備えたディスペンサシステムを用いて塗布対象面にガスケットシール成形材料を塗布することによってガスケットを製造する方法であって、前記ニードルの吐出口の開口形状を異形断面とすることにより、成形後のガスケットシールの断面形状を、その高さをｈ、その最大幅をｗとして、ｈ／ｗ≧１とすることを特徴とするものである。

【０００９】また、本発明の請求項２によるガスケットの製造方法は、上記した請求項１のガスケットの製造方法において、ニードルに後退角を設定したものを用いることを特徴とするものである。

【００１０】また、本発明の請求項３によるガスケットの製造方法は、上記した請求項１または２のガスケットの製造方法において、ニードルに塗布対象面に対して平行方向および直角方向に移動するとともにその中心軸を中心として回転作動するものを用いることを特徴とするものである。

【００１１】また、本発明の請求項４によるガスケットは、ニードルを備えたディスペンサシステムを用いて塗布対象面にガスケットシール成形材料を塗布することによって製造されるガスケットであって、成形後のガスケットシールの断面形状を、その高さをｈ、その最大幅をｗとして、ｈ／ｗ≧１としたことを特徴とするものであり、上記請求項１ないし３の各項の製造方法は、この請求項４のガスケットを製造すべく発明されたものである。

【００１２】

【発明の実施の形態】つぎに本発明の実施例を説明する。

【００１３】上記従来技術における問題点を解決するには、ガスケットの製造方法および、その実施に供されるディスペンサシステムの構成を以下のようにするのが好適である。

【００１４】第一実施例・・・

すなわち先ず第一に、図１（Ａ）および（Ｂ）に示すように、ディスペンサシステム１におけるニードル２の先端形状を異形断面とし、この異形断面のニードル２を用いて塗布対象面としてのガスケット基板２２の一面２２ａに塗布し硬化させるガスケットシール２３の断面形状を、図２（Ａ）に示すように、その高さをｈ、その最大幅をｗとして、ｈ／ｗ≧１となるようにする。

【００１５】異形断面は、断面形状が円形でなく、三角形、四角形、台形、楕円形（もしくは楕円形を長手方向に二分割した片方の形状）または長円形（もしくは長円形を長手方向に二分割した片方の形状）等の非円形であることを云い、ニードル２の先端形状を異形断面とするとは、ニードル２の先端開口形状、すなわちニードル２の先端面２ａにおける吐出口２ｂの開口形状（先端面２ａの内郭形状）を、必要な場合は先端面２ａの外郭形状も含めて、円形とせずに非円形（長手方向を備えた非円形）とすることを云う。

【００１６】図示した実施例においては、図１（Ｂ）に示したように、ニードル２の先端面２ａにおける吐出口２ｂの開口形状を、その底辺の長さｗ’に対する高さｈ’の比率が凡そ１．５となる台形および三角形を組み合わせた形状（概略二等辺三角形）とし、塗布するガスケットシール２３の材質または硬度により多少異なるものの、図２（Ａ）に示すように、相手材２４との組付け前におけるガスケットシール２３の断面形状を同じく、その底辺の長さｗに対する高さｈの比率が凡そ１．５となる台形および三角形を組み合わせた形状とし、図２（Ｂ）に示すように相手材２４との組付け後（つぶし後）におけるガスケットシール２３の断面形状を、その底辺の長さに対する高さの比率が凡そ１～１．２となるようにすることにより、相対圧力０～０．５ＭＰａの範囲で安定したシール性を確保することができる。

【００１７】また、このようにニードル２の先端形状を異形断面とすることにより、

① 相手材２４までの高さが比較的高い場合であってもガスケットシール２３の底辺を比較的小さく設定することが可能であるために、ガスケットシール２３の成形可能位置を広く確保してガスケットシール２３のレイアウトの自由度を広げることができ、また、使用するガスケットシール２３の成形材料の量を少なく抑えることができる、

② 図３のグラフ図に示すように、ガスケットシールつぶし量に対するガスケット反力の増加量が従来技術の場合よりも小さくなるために、ガスケット反力によりガスケット基板２２が変形するのを防止することができる、

③ ガスケットシール２３の高さ公差および、つぶし後の相手材２４との隙間公差を広く設定することが可能であるために、安定したシール性能を確保することができる、と云った作用効果を奏し、このような作用効果を奏する断面形状を備えたガスケット２１を液状のガスケットシール成形材料２３’の一度塗りで得ることができる。

【００１８】尚、この実施例に係るニードル２の構成は、ニードル２の先端部２ｃに切欠部を設けることなくニードル２の先端面２ａを平坦面としたままで、吐出口２ｂの開口形状を異形断面としたものである。

【００１９】また、上記従来技術における問題点に対する第二の解決手段は、図１（Ａ）に示したように、ディスペンサシステム１におけるニードル２の先端部２ｃに所定の大きさの後退角αを持たせるものである。

【００２０】そして、このようにニードル２の先端部２ｃに所定角度の後退角αを持たせると、これにより、上記第一解決手段で示したニードル２形状を効果的に働かすことが可能となり、その結果として、異形断面のガスケットシール２３を安定して成形することができる。

【００２１】また、上記従来技術における問題点に対する第三の解決手段は、図４に示すように、ニードル２を、塗布対象面であるガスケット基板２２の一面２２ａに対して平行方向および直角方向（Ｘ－Ｙ－Ｚ方向）に移動させるだけでなく、その中心軸線０を中心としてθ方向に回転作動可能とするものである。

【００２２】そして、このようにニードル２を、ガスケット基板２２の一面２２ａに対して平行方向および直角方向に移動させるだけでなく、その中心軸線０を中心に回転作動可能とすると、上記第一解決手段で示したニードル２形状を効果的に働かすことが可能となり、その結果として、異形断面のガスケットシール２３を安定して成形することができる。すなわち、ガスケットシール２３の平面レイアウトにおいて、そのカーブや屈曲部では、ゴムシールの内周と外周で長さが異なるために、断面形状がいびつになり易いが、本発明によれば、従来技術の場合よりも形状むらの発生を抑えることができ、これによりガスケット反力が位置によってばらつくのを抑えることができる。

【００２３】尚、ニードル２をその中心軸線０を中心として回転作動させるには、モータ等の回転駆動源の回転トルクをベルト等のトルク伝達手段を介してニードル２に伝達する。

【００２４】また、これらの各Ｘ、Ｙ、ＺおよびθＺ方向の制御は、塗布対象面であるガスケット基板２２を載せたテーブル（図示せず）またはニードル２のうちの何れか一方を移動させることにより両者を相対に移動させれば良く、または両者をそれぞれ移動させることにより両者を相対に移動させるようにしても良い。

【００２５】また、当該実施例において、ガスケットシール材料の粘度は凡そ２０００～５００００ｐｏｉｓｅを想定しているが、その範囲は５００～５００００ｐｏｉｓｅほどであっても良い。

【００２６】第二実施例・・・

上記従来技術における問題点に対する第四の解決手段は、図５（Ａ）（Ｂ）および（Ｃ）に示すように、ディスペンサシステム１におけるニードル２の先端部２ｃに切欠部３を設けることによりニードル２の吐出口２ｂの開口形状を異形断面とし、この異形断面の吐出口２ｂを備えたニードル２を用いて塗布対象面としてのガスケット基板２２の一面２２ａに塗布し硬化させるガスケットシール２３の断面形状を、図６に示すように、その高さをｈ、その最大幅をｗとして、ｈ／ｗ≧１となるようにする。

【００２７】図示した実施例においては、内径寸法ｄがφ１．４５ｍｍの円筒形状のニードル２に対して、幅ｗ$_1$が１．３４ｍｍ、高さｈ$_1$が２．９ｍｍの切欠部３が、軸直角の先端面２ａを一部残して先端部２ｂを斜めにカットするように設けられており、このような切欠部３が設けられることによって、後（あと）は塗布圧力の調節により、ｈ／ｗ≧１を満足するガスケット１を製造することができる。そして、このようにニードル２の先端部２ｂに切欠部３を設けてニードル２の先端開口形状を異形断面とすることにより、

① 相手材（図示せず）までの高さが比較的高い場合であってもガスケットシール２３の底辺を比較的小さく設定することが可能であるために、ガスケットシール２３の成形可能位置を広く確保してガスケットシール２３のレイアウトの自由度を広げることができ、また、使用するガスケットシール２３の成形材料の量を少なく抑えることができる、

② 図７のグラフ図に示すように、ガスケットシールつぶし量に対するガスケット反力の増加量が従来技術の場合よりも小さくなるために、ガスケット反力によりガスケット基板２２が変形するのを防止することができる、

③ ガスケットシール２３の高さ公差および、つぶし後の相手材２４との隙間公差を広く設定することが可能であるために、安定したシール性能を確保することができる、と云った作用効果を奏し、このような作用効果を奏する断面形状を備えたガスケット２１を液状のガスケットシール成形材料２３'の一度塗りで得ることができる。

【００２８】尚、図示したニードル２先端の切欠形状は一例であり、塗布する材料、塗布後のねらいの形状およびニードル２内径や塗布圧力といった塗布条件により、適宜設定するものである。

【００２９】また、上記従来技術における問題点に対する第五の解決手段は、図８に示すように、ニードル２を、塗布対象面であるガスケット基板２２の一面２２ａに対して平行方向および直角方向（Ｘ－Ｙ－Ｚ方向）に移動させるだけでなく、その中心軸線０を中心としてθ方向に回転作動可能とするものである。

【００３０】そして、このようにニードル２を、ガスケット基板２２の一面２２ａに対して平行方向および直角方向に移動させるだけでなく、その中心軸線０を中心に回転作動可能とすると、上記第四解決手段で示したニードル２形状を効果的に働かすことが可能となり、その結果として、異形断面のガスケットシール２３を安定して成形することができる。すなわち、ガスケットシール２３の平面レイアウトにおいて、そのカーブや屈曲部では、ゴムシールの内周と外周で長さが異なるために、断

面形状がいびつになり易いが、本発明によれば、従来技術の場合よりも形状むらの発生を抑えることができ、これによりガスケット反力が位置によってばらつくのを抑えることができる。

【００３１】θ方向制御方法は、一般には、Ｚ軸（すなわちθ回転軸）に治具を介してディスペンサ１が取り付けられるために、その腕にあたる部分のプログラム補正が必要となるだけでなく、ディスペンサ１の重量分の回転トルクが必要となり、モータや消費電力の増加につながる。このときの治具およびディスペンサ１形状によっては、Ｚ軸は３６０度以上回転可能でもディスペンサ１がロボットの骨組みに干渉して、１８０度程度しか回転することができなくなる場合もある。また、ニードル２の先端に切欠部３を設け、ロボットを産業用ロボットのような６軸制御にした場合には、ロボットのコストが本発明に対して約２倍になってしまう。しかしながらこれに対して、ディスペンサ１の回転構造を図９または図１０に示すように、Ｚ軸ステー４にディスペンサ本体を取り付け、Ｚ軸５に取り付けたニードル２を回転させる構造とすることにより、

① 作動プログラムの簡易化によるプログラミング時間の短縮および正確性の向上、

② Ｚ軸作動モータの低トルク化（低容量化）および小型化によるその分の可搬重量の増加、

③ Ｚ軸の可動回転角度を有効に働かせることができることによるディスペンサ１の形状および大きさの制約の減少、

④ ６軸ロボットを使用する場合に比べてロボット本体でコストを約１／２とすることができる、と云った効果を得ることができる。

【００３２】また、これらの各Ｘ、Ｙ、ＺおよびθＺ方向の制御は、塗布対象面であるガスケット基板２２を載せたテーブル（図示せず）またはニードル２のうちの何れか一方を移動させることにより両者を相対に移動させれば良く、または両者をそれぞれ移動させることにより両者を相対に移動させるようにしても良い。

【００３３】尚、当該実施例において、ガスケットシール材料の粘度は凡そ５００～５００００ｐｏｉｓｅを想定している。ガスケットシール材料としては例えば、ＵＶポリウレタンや、信越シリコーン製シリコーンゴム（ＲＴＶゴム）、シリコーン接着剤等が好適である。

【００３４】また、本発明において、ガスケットシール２３の断面形状には、図２（Ａ）または図６に示したものの他、様々なものが考えられ、例えば以下のものを挙げることができる。

【００３５】① 図１１に示すように、ガスケットシール２３の断面形状を略三角形とする。

② 図１２に示すように、ガスケットシール２３の断面形状を略四角形とする。

③ 図１３に示すように、ガスケットシール２３の断面形状を、その上端部を半円形に形成した略四角形とする。

④ 図１４に示すように、ガスケットシール２３の断面形状を、その下端部に長辺を配置した略台形とする。

⑤ 図１５に示すように、ガスケットシール２３の断面形状を、その上端部に長辺を配置した略台形とする。

⑥ 図１６に示すように、ガスケットシール２３の断面形状を略五角形とする。

⑦ 図１７に示すように、ガスケットシール２３の断面形状を、その下端部を平たくカットした略楕円形とする。

【００３６】この①ないし⑦の断面形状のうち、①ないし④の断面形状はその下端部に最大幅ｗが設定されるが、⑤ないし⑦の断面形状は、所定の幅$w_1$を備えた下端部以外の部分に最大幅ｗが設定されることになる。

【００３７】

【発明の効果】本発明は、以下の効果を奏する。

【００３８】すなわち、上記構成を備えた本発明の請求項１によるガスケットの製造方法においては、ニードルの吐出口の開口形状を異形断面とすることにより成形後のガスケットシールの断面形状を、その高さをｈ、その最大幅をｗとして、ｈ／ｗ≧１とすることによって、ガスケットシールの相手材までの高さが比較的高い場合であってもガスケットシールの底辺を比較的小さく設定することが可能であるために、ガスケットシールの成形可能位置を広く確保してガスケットシールのレイアウトの自由度を広げることができ、また、使用するガスケットシール材料の量を少なく抑えることができる。また、ガスケットシールつぶし量に対するガスケット反力の増加量を従来よりも小さくすることが可能であるために、ガスケット反力によりガスケット基板等が変形するのを防止することができる。また、ガスケットシールの高さ公差および、つぶし後の相手材との隙間公差を広く設定することが可能であるために、安定したシール性能を確保することができる。

【００３９】またこれに加えて、上記構成を備えた本発明の請求項２によるガスケットの製造方法においては、ニードルに所定角度の後退角を設定することにより、上記請求項１におけるニードルを効果的に働かすことができ、その結果として、異形断面のガスケットシールを安定して供給することができる。

【００４０】また、上記構成を備えた本発明の請求項３によるガスケットの製造方法においては、ニードルを塗布対象面に対して平行方向および直角方向に移動させるだけでなくその中心軸線を中心に回転作動させることにより、上記請求項１または２におけるニードルを効果的に働かすことができ、その結果として、異形断面のガスケットシールを安定して供給することができる。

【００４１】更にまた、上記構成を備えた本発明の請求項４によるガスケットにおいては、上記各請求項におけ

る作用効果を有するガスケット、すなわち反力が比較的小さく、反力のばらつきが少なく、耐久性およびシール性に優れたガスケット製品を提供することができる。

【図面の簡単な説明】

【図１】（Ａ）は本発明の第一実施例に係るガスケットの製造方法の実施に供されるディスペンサシステムの要部正面図であって同システムに備えられるニードルの正面図、（Ｂ）は同図（Ａ）におけるＡ方向矢視拡大図であって上記ニードルの先端面拡大図

【図２】（Ａ）は同実施例に係るガスケットの成形後の状態を示す要部断面図、（Ｂ）は同ガスケットのつぶし後の状態を示す要部断面図

【図３】ガスケットシールつぶし量とガスケット反力の関係を示すグラフ図

【図４】同ディスペンサシステムの作動説明図

【図５】（Ａ）は本発明の第二実施例に係るガスケットの製造方法の実施に供されるディスペンサシステムの要部側面図であって同システムに備えられるニードルの要部正面図、（Ｂ）は同ニードルの要部側面図、（ｃ）は同ニードルの底面図

【図６】同実施例に係るガスケットの成形後の状態を示す要部断面図

【図７】ガスケットシールつぶし量とガスケット反力の関係を示すグラフ図

【図８】同ディスペンサシステムの作動説明図

【図９】同ディスペンサシステムの回転構造の一例を示す断面図

【図１０】同ディスペンサシステムの回転構造の他の例を示す断面図

【図１１】本発明の他の実施例に係るガスケットの要部断面図

【図１２】本発明の他の実施例に係るガスケットの要部断面図

【図１３】本発明の他の実施例に係るガスケットの要部断面図

【図１４】本発明の他の実施例に係るガスケットの要部断面図

【図１５】本発明の他の実施例に係るガスケットの要部断面図

【図１６】本発明の他の実施例に係るガスケットの要部断面図

【図１７】本発明の他の実施例に係るガスケットの要部断面図

【図１８】（Ａ）および（Ｂ）ともそれぞれ従来例に係るガスケットの要部断面図

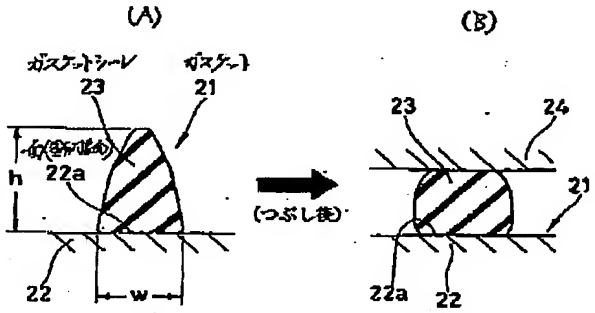
【図１９】（Ａ）は従来例に係るディスペンサシステムの要部正面図であって同システムに備えられるニードルの正面図、（Ｂ）は同図（Ａ）におけるＢ方向矢視拡大図であって上記ニードルの先端面拡大図

【図２０】同ディスペンサシステムの作動説明図

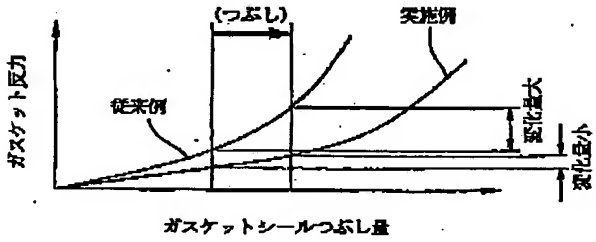
【符号の説明】

１　ディスペンサシステム
２　ニードル
２ａ　先端面
２ｂ　吐出口
２ｃ　先端部
３　切欠部
４　Ｚ軸ステー
５　Ｚ軸
２１　ガスケット
２２　ガスケット基板
２２ａ　一面（塗布対象面）
２３　ガスケットシール
２３'　ガスケットシール成形材料
Ｏ　中心軸線

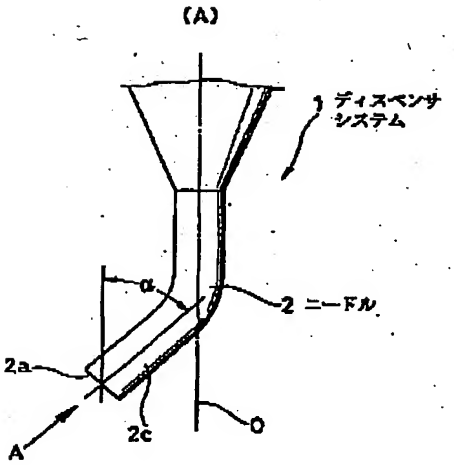
【図２】



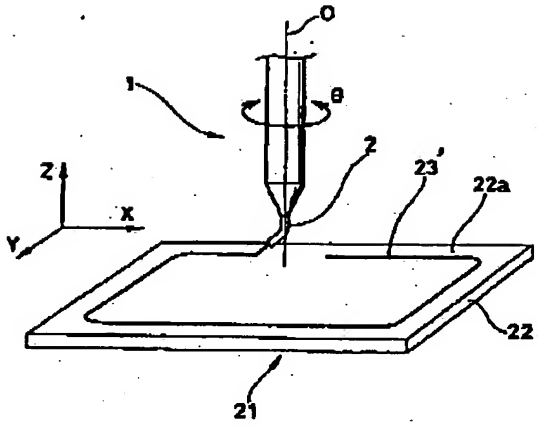

【図３】



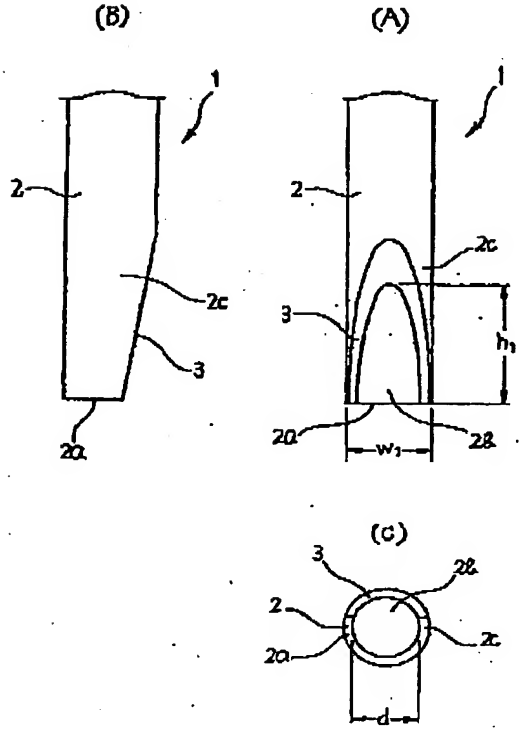
【図１】



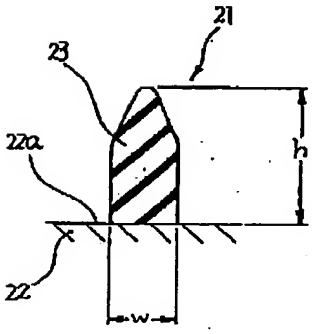

【図４】




【図５】




【図６】



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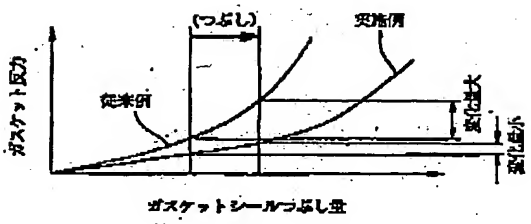


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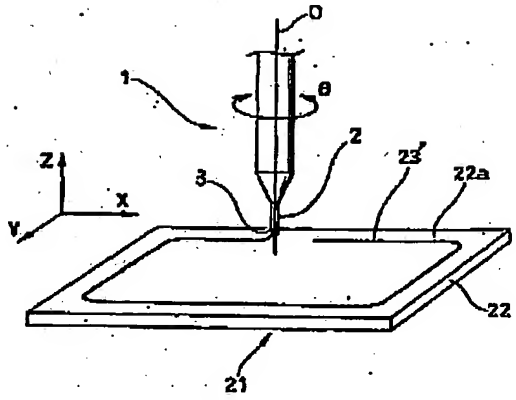


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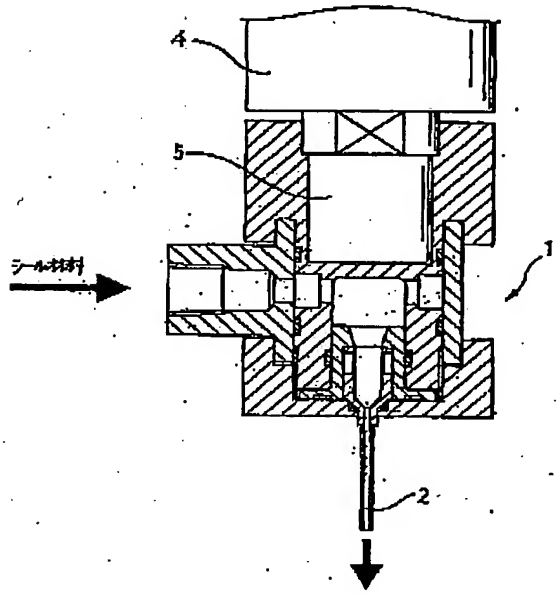
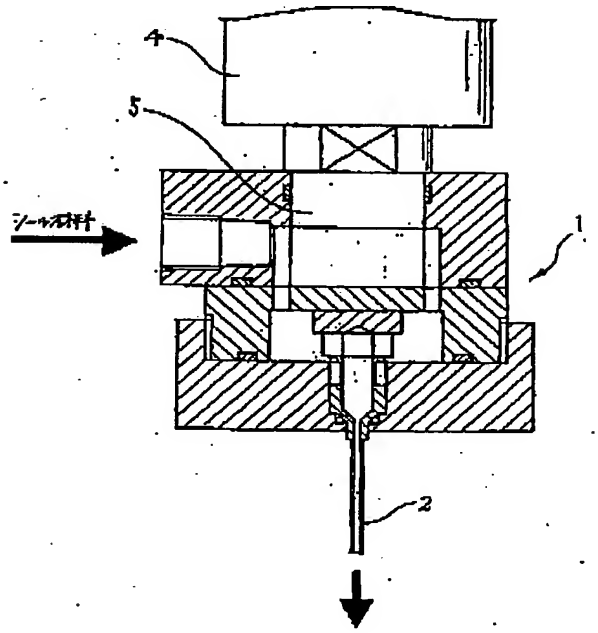
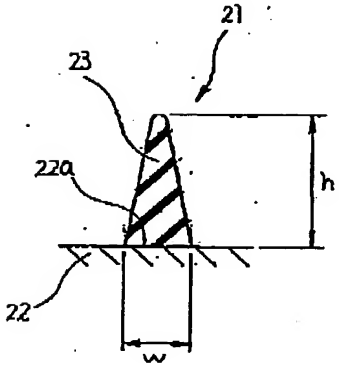



【図１０】




【図１１】



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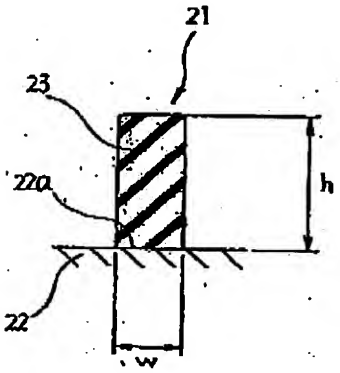


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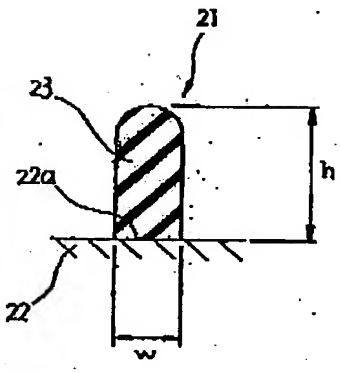


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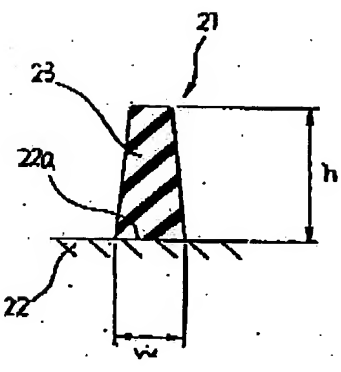


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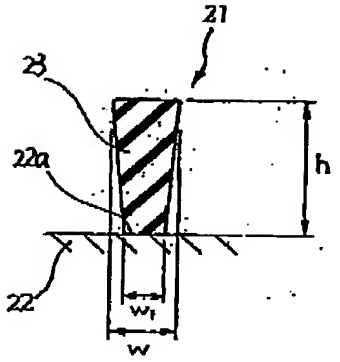


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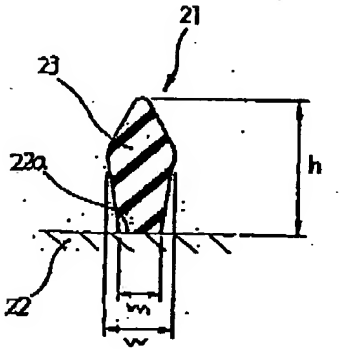
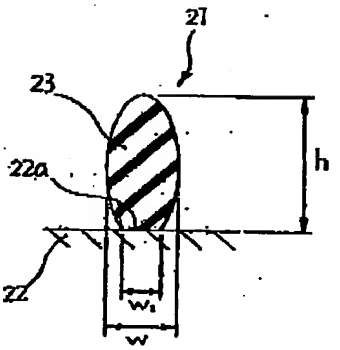
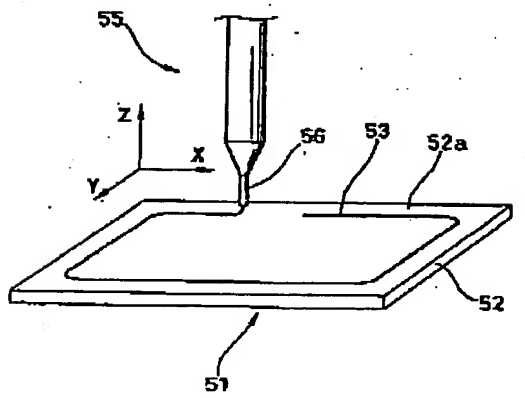


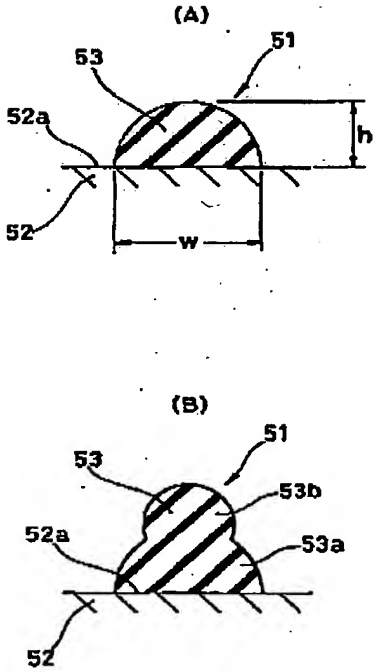

【図１７】



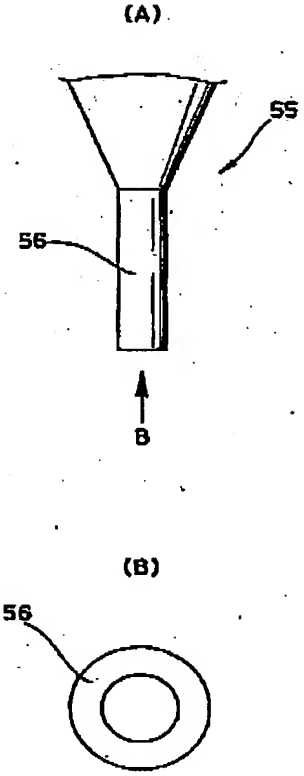

【図２０】



【図１８】




【図１９】

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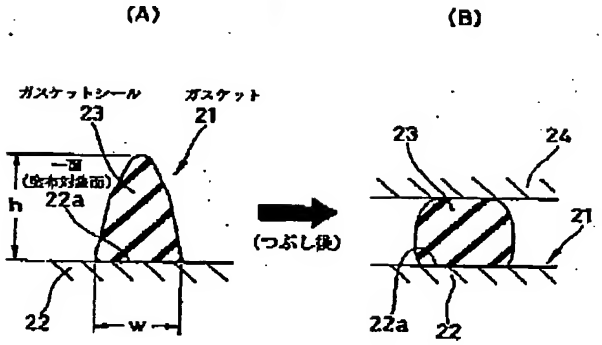
【手続補正書】
【提出日】平成１４年２月１４日（２００２．２．１４）
【手続補正１】
【補正対象書類名】図面
【補正対象項目名】全図
【補正方法】変更
【補正内容】

【図２】

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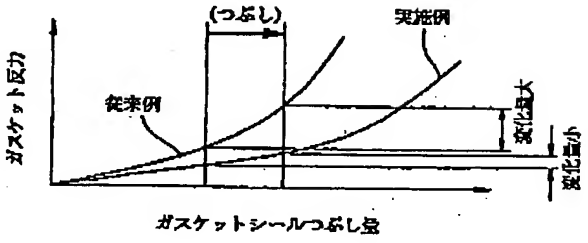

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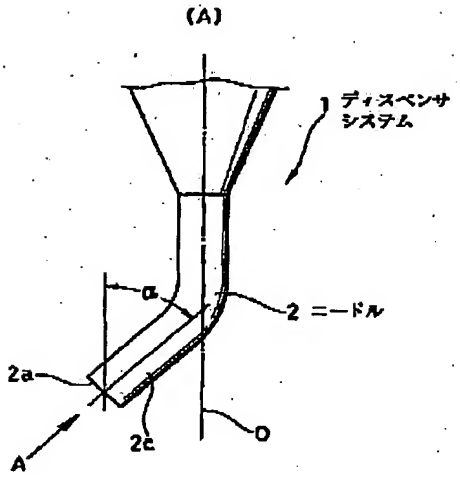
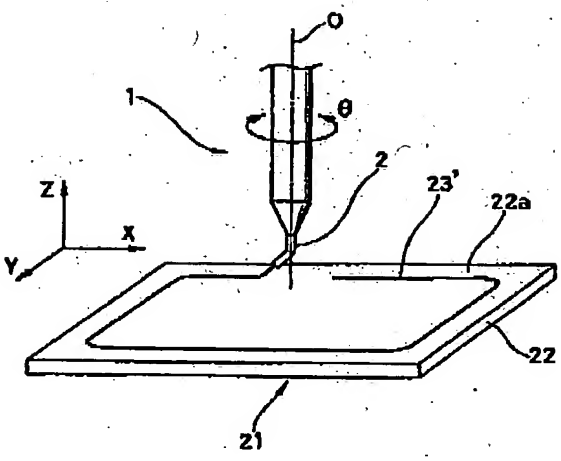

(A)
ディスペンサシステム
α
2 ニードル
2a
2c
O
A
(B)
2
2a
2b
h'
2c
w'

【図４】


O
1
θ
2
23'
22a
Z
X
Y
22
21

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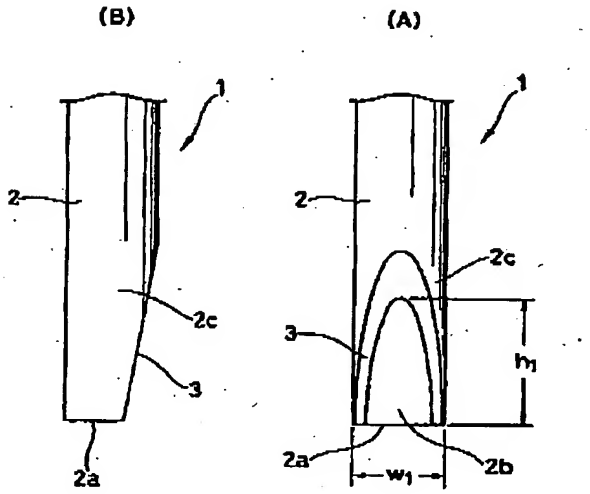
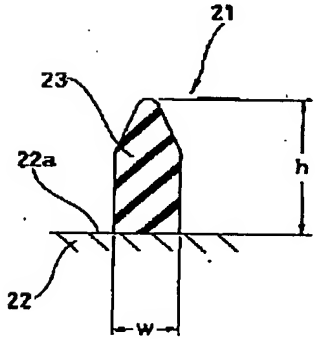
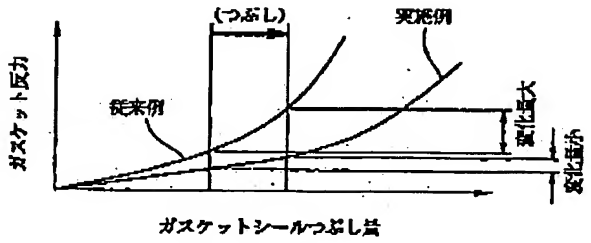

(B)
(A)
1
2
2c
3
2a
h1
w1
2b
(C)
3
2b
2
2a
2c
d

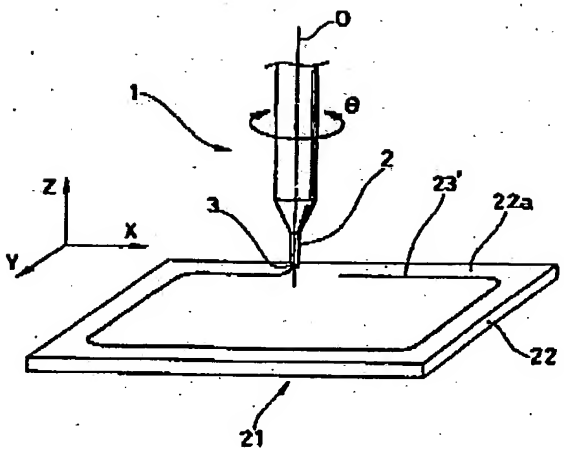
【図６】


21
23
22a
h
22
w

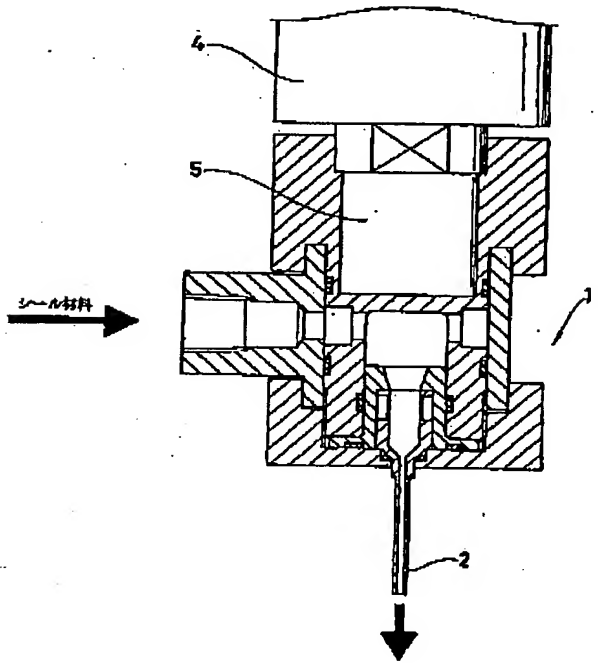
【図７】


(つぶし)
実施例
従来例
ガスケット反力
変化量大
変化量小
ガスケットシールつぶし量

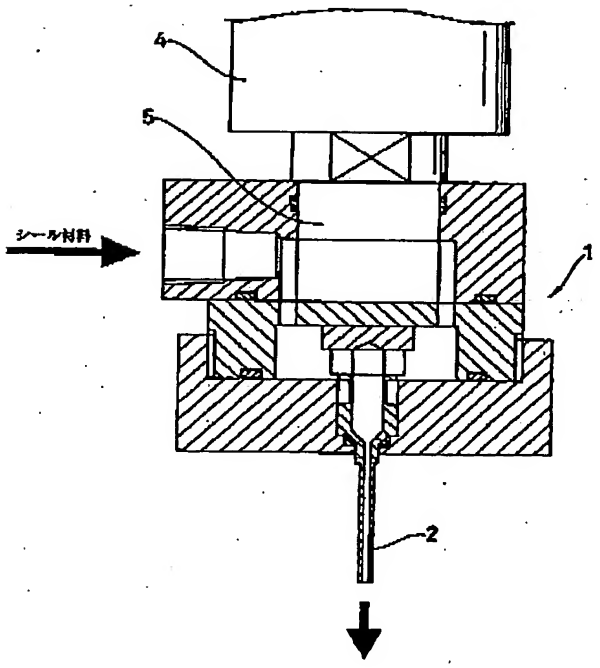
【図８】


0
1
θ
2
23'
22a
Z
X
Y
3
22
21

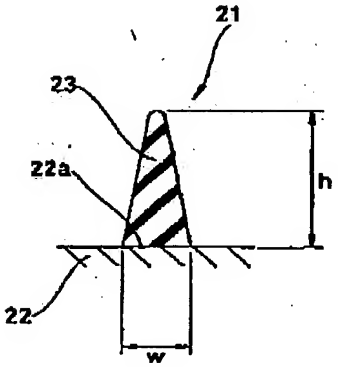
【図９】


4
5
シール材料
1
2

【図１０】


4
5
シール材料
1
2

【図１１】

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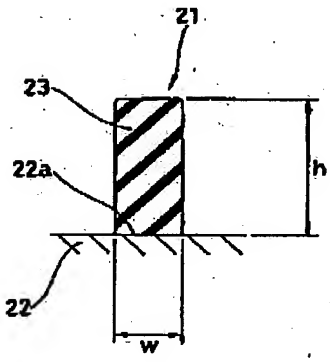


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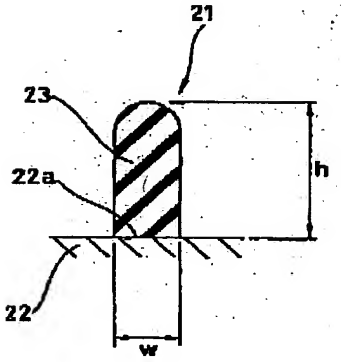


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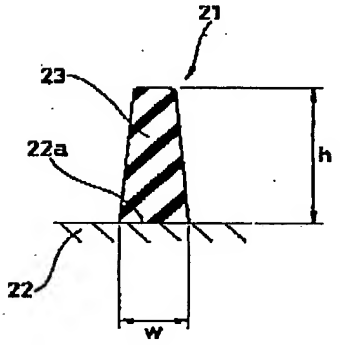


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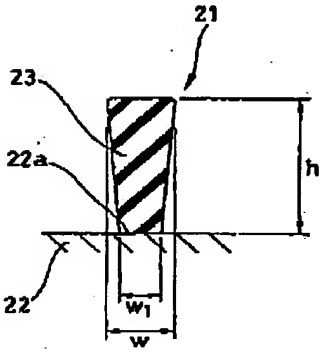


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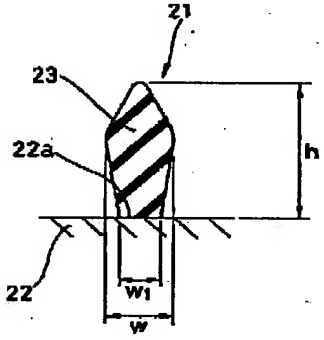


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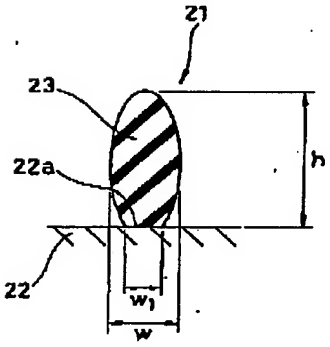


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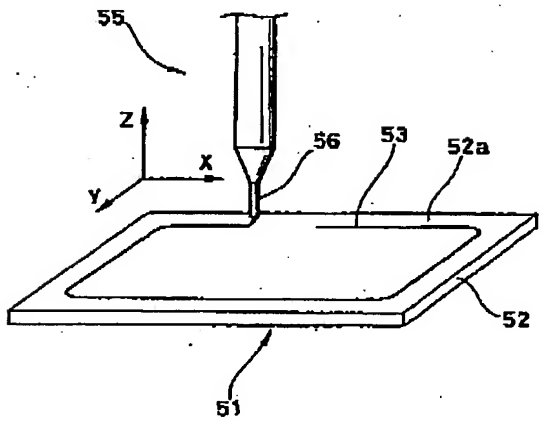

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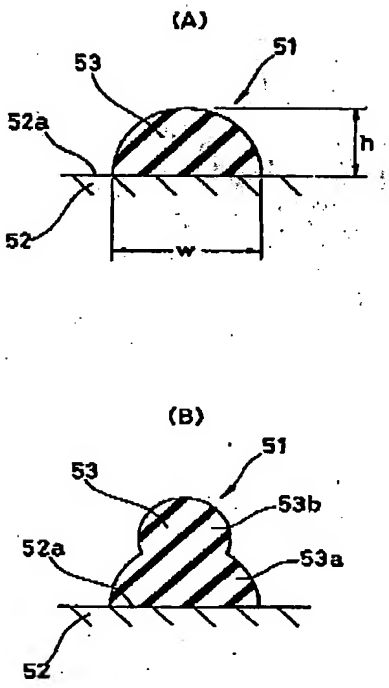


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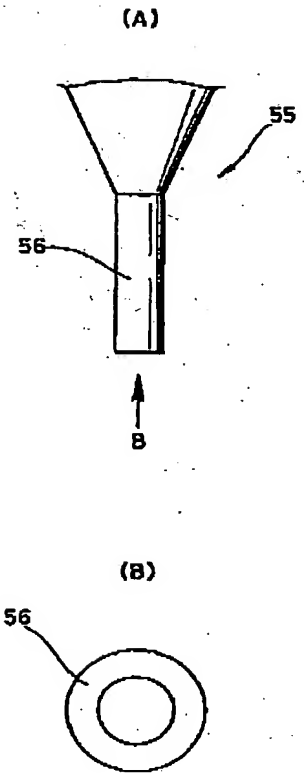

## DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the gasket which is a kind of a sealing device, and relates to the gasket especially manufactured using a dispenser system, and its manufacture approach.
[0002]
[Description of the Prior Art] Although it has been thought till today that the gasket manufactured by the dispenser system is generally a simple gasket, it is observed from that the manufacture is easy and a manufacturing cost being cheap, and, recently, the interest has been increasing with amplification of a function.
[0003] Here, if the outline structure of the gasket 51 manufactured by this dispenser system is shown in drawing 18 (A) as a conventional example, by applying a liquefied gasket seal molding material to whole surface 52a of the gasket substrate 52 as a field for spreading, the gasket 51 is fabricated and let the cross-section configuration of the gasket seal 53 after shaping be an abbreviation semicircle.
[0004] Moreover, as the needle 56 in the conventional dispenser system 55 is shown in drawing 19 (A) and (B), the head opening configuration is circular and the point is made straight [ angle-of-sweepback zero ], and as the control direction of the dispenser system 55, i.e., the actuation direction of a needle 56, is shown in drawing 20 , it considers only as the parallel direction to field 22for spreading a, and the direction of a right angle (X-Y-Z direction).
[0005] However, it sets to the gasket 51 manufactured by this conventional dispenser system 55. Since it becomes what the cross-section configuration of the gasket seal 53 after shaping set the height to h, set the maximum width to w, and was limited to $h/w<1$, considering the above-mentioned head opening configuration of a needle 56 etc. ** From the die length of the base of the gasket seal 53 becoming long, and the width of face becoming large, when the height to partner material is comparatively high If the height is made high in order to raise the endurance of the ** gasket seal 53 with which the amount of the molding material which constraint arises in the location of the gasket seal 53 which can be fabricated, and is needed for shaping of the gasket seal 53 increases On the occasion of the nest of a gasket 51, gasket reaction force becomes high in first stage. Depending on the case In the part in which the flat-surface configuration of the ** gasket seal 53 which may deform the gasket substrate 52 according to the gasket reaction force which became high too much is curved or crooked, since die length differs by the inner circumference and periphery side As an approach of a cross-section configuration tending to become distorted, and there being inconvenience which said that the magnitude of gasket reaction force would change with flat-surface locations as the result, and avoiding such inconvenience ** Although the approach referred to as using a dispenser, fabricating base 53a to the 1st time, and fabricating up 53b to the 2nd time, namely, performing coating twice can be considered as shown in ** drawing 18 (B) which fabricates the gasket seal 53 by options, such as injection molding Neither of the approaches can start cost and the demand function in recent years cannot fully be satisfied.
[0006] It is related with the head configuration of a needle until now. Moreover, besides a

circular cross section and a straight nozzle Although what made the needle bore tapering off (refer to JP,62-258776,A or JP,9-239976,A), the thing (refer to JP,7-318747,A) which prepared the include angle at the head of a needle are developed In case these conventional techniques carry out dispenser spreading of the liquid (3 - 300cpoise) of hypoviscosity comparatively, they are proposed for plugging prevention of a needle, or stabilization of coverage, and they do not set the cross-section configuration of the gasket seal after shaping to h/w>=1 like this invention.

[0007]

[Problem(s) to be Solved by the Invention] In the approach of manufacturing a gasket in view of the point of a more than [ this invention ] using a dispenser system Even if it is the case that the height to partner material is comparatively high, while it is possible to be able to set up the base of a gasket seal comparatively small, to have it, and to secure widely the location of a gasket seal which can be fabricated The manufacture approach [ it is possible to stop the amount of the gasket seal molding material used few, and it is possible to suppress gasket reaction force small, and ] of a gasket which can stop that gasket reaction force varies greatly with a location further, It aims at offering the gasket manufactured by this approach.

[0008]

[Means for Solving the Problem] In order to attain the above-mentioned object, the manufacture approach of the gasket by claim 1 of this invention By being the approach of manufacturing a gasket by applying a gasket seal molding material to the field for spreading using the dispenser system equipped with the needle, and making the opening configuration of the delivery of said needle into a variant cross section It is characterized by setting the cross-section configuration of the gasket seal after shaping to h/w>=1, using the maximum width as w using the height as h.

[0009] Moreover, the manufacture approach of the gasket by claim 2 of this invention is characterized by using what set the angle of sweepback as the needle in the manufacture approach of the above-mentioned gasket of claim 1.

[0010] Moreover, in the manufacture approach of the above-mentioned gasket of claims 1 or 2, the manufacture approach of the gasket by claim 3 of this invention is characterized by using what carries out revolution actuation a core [ the medial axis ] while it moves in a parallel direction and the direction of a right angle to the field for spreading at a needle.

[0011] Moreover, the gasket by claim 4 of this invention It is the gasket manufactured by applying a gasket seal molding material to the field for spreading using the dispenser system equipped with the needle. It is characterized by setting the cross-section configuration of the gasket seal after shaping to h/w>=1, having used that maximum width as w having used that height as h, and the manufacture approach of above-mentioned claim 1 thru/or each item of 3 is invented that the gasket of this claim 4 should be manufactured.

[0012]

[Embodiment of the Invention] The example of this invention is explained below.

[0013] In order to solve the trouble in the above-mentioned conventional technique, it is suitable to perform as follows the manufacture approach of a gasket and the dispenser structure of a system with which the operation is presented.

[0014] The first example ... Namely, first, as shown in the first place at drawing 1 (A) and (B) The head configuration of the needle 2 in the dispenser system 1 is made into a variant cross section. The cross-section configuration of the gasket seal 23 which applies to whole surface 22a of the gasket substrate 22 as a field for spreading, and it is made to harden using the needle 2 of this variant cross section is made to be set to h/w>=1 as shown in drawing 2 (A), using that maximum width as w using that height as h.

[0015] It says that a variant cross section does not have a circular cross-section configuration, and it is [ ellipse / (or configuration of one of the two which halved the ellipse to the longitudinal direction) / a triangle, a square, a trapezoid, an ellipse form (or configuration of one of the two which halved the ellipse form to the longitudinal direction), or ] un-circular. making the head configuration of a needle 2 into a variant cross section it says supposing that it is un-circular (it had the longitudinal direction -- un-circular), without making circular the head opening configuration of a needle 2, i.e., the opening configuration of delivery 2b in apical surface 2a of a

needle 2, (inner hull configuration of apical surface 2a) also including the outline configuration of apical surface 2a, when required.

[0016] In the illustrated example, as shown in drawing 1 (B), the opening configuration of delivery 2b in apical surface 2a of a needle 2 It considers as the configuration (outline isosceles triangle) which combined the trapezoid and triangle from which the ratio of height h' to die-length w' of the base is set to about 1.5. Although it changes somewhat with the construction material or the degrees of hardness of the gasket seal 23 to apply, as shown in drawing 2 (A) The cross-section configuration of the gasket seal 23 before assembly with the partner material 24 similarly It considers as the configuration which combined the trapezoid and triangle from which the ratio of height h to die-length w of the base is set to about 1.5. As shown in drawing 2 (B), when making it the ratio of the height to the die length of the base set to about 1-1.2, the cross-section configuration of the gasket seal 23 after assembly with the partner material 24 (after crushing) The seal nature stabilized in the range of relative pressure 0-0.5MPa is securable.

[0017] Moreover, since it is possible to set up the base of the gasket seal 23 comparatively small even if it is the case that the height to the ** partner material 24 is comparatively high, by making the head configuration of a needle 2 into a variant cross section in this way The location of the gasket seal 23 which can be fabricated can be secured widely, and the degree of freedom of the layout of the gasket seal 23 can be extended. Moreover, as the amount of the molding material of the gasket seal 23 to be used is shown in the graphical representation of ** drawing 3 which can be stopped few Since it becomes smaller than the case where the augend of gasket reaction force to the amount of gasket seal crushing is the conventional technique Since it is possible to set up widely the height tolerance of the ** gasket seal 23 which can prevent that the gasket substrate 22 deforms according to gasket reaction force, and clearance tolerance with the partner material 24 after crushing The gasket 21 equipped with the cross-section configuration which does so the operation effectiveness which said that the stable seal engine performance was securable, and does such operation effectiveness so can be obtained by once coating of liquefied gasket seal molding material 23'.

[0018] In addition, the configuration of the needle 2 concerning this example makes the opening configuration of delivery 2b a variant cross section, making apical surface 2a of a needle 2 into a flat side without preparing a notch in point 2c of a needle 2.

[0019] Moreover, the second [ to the trouble in the above-mentioned conventional technique ] solution means gives the angle of sweepback alpha of predetermined magnitude to point 2c of the needle 2 in the dispenser system 1, as shown in drawing 1 (A).

[0020] And if the angle of sweepback alpha of a predetermined include angle is given to point 2c of a needle 2 in this way, this is enabled to use effectively the shape of needle dimorphism shown with the above-mentioned first solution means, as the result, it is stabilized and the gasket seal 23 of a variant cross section can be fabricated.

[0021] Moreover, not only making it move in a parallel direction and the direction of a right angle (X-Y-Z direction) but the third [ to the trouble in the above-mentioned conventional technique ] solution means enables revolution actuation of a needle 2 in the direction of theta focusing on the medial axis line 0 to whole surface 22a of the gasket substrate 22 which is a field for spreading, as show in drawing 4 .

[0022] and in this way , if not only make it move in a parallel direction and the direction of a right angle but revolution actuation of a needle 2 be enable focusing on the medial axis line 0 to whole surface 22a of the gasket substrate 22 , it become possible to use effectively the shape of needle dimorphism showed with the above-mentioned first solution means , and as the result , it be stabilize and the gasket seal 23 of a variant cross section can be fabricate . That is, in the flat-surface layout of the gasket seal 23, although a cross-section configuration tends to become distorted in the curve and flection since die length differs on the inner circumference and the periphery of a rubber seal, according to this invention, generating of configuration unevenness can be suppressed rather than the case of the conventional technique, and it can stop that gasket reaction force varies with a location by this.

[0023] In addition, in order to carry out revolution actuation of the needle 2 a core [ the medial-axis line 0 ], the running torque of revolution driving sources, such as a motor, is transmitted to a

needle 2 through means of torque transmission, such as a belt.
[0024] Moreover, you may make it control of each X [ these ], Y and Z, and the direction of theta move both to relativity by moving both, respectively that what is necessary is just to move both to relativity by moving either the table (not shown) which carried the gasket substrate 22 which is a field for spreading or the needles 2.
[0025] Moreover, in the example concerned, although the viscosity of a gasket sealing material assumes about 2000 to 50000 poise, the range may be like 500 - 50000poise.
[0026] The second example ... the fourth [ to the trouble in the above-mentioned conventional technique ] solution means As shown in drawing 5 (A), (B), and (C), the opening configuration of delivery 2b of a needle 2 is made into a variant cross section by forming a notch 3 in point 2c of the needle 2 in the dispenser system 1. The cross-section configuration of the gasket seal 23 which applies to whole surface 22a of the gasket substrate 22 as a field for spreading, and it is made to harden using the needle 2 equipped with delivery 2b of this variant cross section is made to be set to h/w>=1 as shown in drawing 6 , using that maximum width as w using that height as h.
[0027] As opposed to the needle 2 of the shape of a cylindrical shape whose d is the inside diameter ofphi1.45mm in the illustrated example By being prepared so that the notch 3 whose width of face w1 is 1.34mm and whose height h1 is 2.9mm may leave a part of apical surface 2a of an axial right angle and may cut point 2b aslant, and forming such a notch 3 By accommodation of the coating pressure force, the rest (after) can manufacture the gasket 1 with which are satisfied of h/w>=1. And by forming a notch 3 in point 2b of a needle 2, and making the head opening configuration of a needle 2 into a variant cross section in this way ** Since it is possible to set up the base of the gasket seal 23 comparatively small even if it is the case that the height to partner material (not shown) is comparatively high The location of the gasket seal 23 which can be fabricated can be secured widely, and the degree of freedom of the layout of the gasket seal 23 can be extended. Moreover, as the amount of the molding material of the gasket seal 23 to be used is shown in the graphical representation of ** drawing 7 which can be stopped few Since it becomes smaller than the case where the augend of gasket reaction force to the amount of gasket seal crushing is the conventional technique Since it is possible to set up widely the height tolerance of the ** gasket seal 23 which can prevent that the gasket substrate 22 deforms according to gasket reaction force, and clearance tolerance with the partner material 24 after crushing The gasket 21 equipped with the cross-section configuration which does so the operation effectiveness which said that the stable seal engine performance was securable, and does such operation effectiveness so can be obtained by once coating of liquefied gasket seal molding material 23'.
[0028] In addition, the notching configuration at needle 2 illustrated head is an example, and is suitably set up according to the spreading conditions of the configuration and needle 2 bore, and coating pressure force of an aim after the ingredient to apply and spreading.
[0029] Moreover, not only making it move in a parallel direction and the direction of a right angle (X-Y-Z direction) but the fifth [ to the trouble in the above-mentioned conventional technique ] solution means enables revolution actuation of a needle 2 in the direction of theta focusing on the medial axis line 0 to whole surface 22a of the gasket substrate 22 which is a field for spreading, as show in drawing 8 .
[0030] and in this way , if not only make it move in a parallel direction and the direction of a right angle but revolution actuation of a needle 2 be enable focusing on the medial axis line 0 to whole surface 22a of the gasket substrate 22 , it become possible to use effectively the shape of needle dimorphism showed with the above-mentioned fourth solution means , and as the result , it be stabilize and the gasket seal 23 of a variant cross section can be fabricate . That is, in the flat-surface layout of the gasket seal 23, although a cross-section configuration tends to become distorted in the curve and flection since die length differs on the inner circumference and the periphery of a rubber seal, according to this invention, generating of configuration unevenness can be suppressed rather than the case of the conventional technique, and it can stop that gasket reaction force varies with a location by this.
[0031] Generally, since a dispenser 1 is attached in the Z-axis (namely, theta revolving shaft)

through a jig, program amendment of the part which hits the arm is not only needed, but the running torque for weight of a dispenser 1 is needed, and the theta directional-control approach leads to the increment in a motor or power consumption. Even if the Z-axis is pivotable 360 degrees or more, also when a dispenser 1 interferes in a robot's skeleton depending on the jig at this time, and dispenser 1 configuration and it becomes impossible to be rotated only about 180 degrees, there is. Moreover, when a notch 3 is formed at the head of a needle 2 and a robot is made into six five axis controls like an industrial robot, a robot's cost will double [ about ] to this invention. As shown in drawing 9 or drawing 10 R> 0, carrying out a deer, the rotational structure of a dispenser 1 By considering as the structure of making the Z-axis stay 4 rotating the needle 2 which attached the dispenser body in installation and the Z-axis 5 ** Compaction of the programming time by simplification of an actuation program, and the improvement in accuracy, ** The increment in the load capacity of the part by the reduction in torque (low-capacity-izing) and miniaturization of a Z-axis actuation motor, ** the case where the configuration of the dispenser 1 by the ability to use movable angle of rotation of the Z-axis effectively and reduction of constraint of magnitude, and a ** 6 shaft robot are used -- comparing -- a robot body -- cost -- about -- the effectiveness referred to as being referred to as one half can be acquired.

[0032] Moreover, you may make it control of each X [ these ], Y and Z, and the direction of theta move both to relativity by moving both, respectively that what is necessary is just to move both to relativity by moving either the table (not shown) which carried the gasket substrate 22 which is a field for spreading or the needles 2.

[0033] In addition, in the example concerned, the viscosity of a gasket sealing material assumes about 500 to 50000 poise. As a gasket sealing material, for example, UV polyurethane, the silicone rubber made from Shin-etsu silicone (RTV rubber), silicone adhesives, etc. are suitable.

[0034] Moreover, in this invention, although shown in drawing 2 (A) or drawing 6 , others and various things can be considered in the cross-section configuration of the gasket seal 23, for example, the following can be mentioned to it.

[0035] ** As shown in drawing 11 , let the cross-section configuration of the gasket seal 23 be an abbreviation triangle.

** As shown in drawing 12 , let the cross-section configuration of the gasket seal 23 be an abbreviation square.

** As shown in drawing 13 , let the cross-section configuration of the gasket seal 23 be the abbreviation square which formed the upper bed section in the semicircle.

** As shown in drawing 14 , make the cross-section configuration of the gasket seal 23 into the abbreviation trapezoid which has arranged the long side in the soffit section.

** As shown in drawing 15 , make the cross-section configuration of the gasket seal 23 into the abbreviation trapezoid which has arranged the long side in the upper bed section.

** As shown in drawing 16 , make the cross-section configuration of the gasket seal 23 into an abbreviation pentagon.

** As shown in drawing 17 , make the cross-section configuration of the gasket seal 23 into the abbreviation ellipse form which cut the soffit section flat.

[0036] Although, as for the cross-section configuration of ** thru/or **, the maximum width w is set as that soffit section among the cross-section configurations of this ** thru/or **, the maximum width w will be set as parts other than the soffit section which the cross-section configuration of ** thru/or ** equipped with the predetermined width of face w1.

[0037]

[Effect of the Invention] This invention does the following effectiveness so.

[0038] Namely, it sets to the manufacture approach of the gasket by claim 1 of this invention equipped with the above-mentioned configuration. By setting the cross-section configuration of the gasket seal after shaping to h/w>=1 by making the opening configuration of the delivery of a needle into a variant cross section, using the maximum width as w using the height as h Since it is possible to set up the base of a gasket seal comparatively small even if it is the case that the height to the partner material of a gasket seal is comparatively high The amount of the gasket sealing material which can secure widely the location of a gasket seal which can be fabricated,

and can extend the degree of freedom of the layout of a gasket seal, and is used can be stopped few. Moreover, since it is possible to make augend of gasket reaction force to the amount of gasket seal crushing smaller than before, it can prevent that a gasket substrate etc. deforms according to gasket reaction force. Moreover, since it is possible to set up widely the height tolerance of a gasket seal and clearance tolerance with the partner material after crushing, the stable seal engine performance is securable.

[0039] In addition to this, by setting the angle of sweepback of a predetermined include angle as a needle in the manufacture approach of the gasket by claim 2 of this invention equipped with the above-mentioned configuration, the needle in above-mentioned claim 1 can be used effectively, as the result, it is stabilized and the gasket seal of a variant cross section can be supplied again.

[0040] Moreover, in the manufacture approach of the gasket by claim 3 of this invention equipped with the above-mentioned configuration, not only by making it move in a parallel direction and the direction of a right angle but by carrying out revolution actuation of the needle a core [ the medial-axis line ] to the field for spreading, the needle in above-mentioned claims 1 or 2 can be used effectively, as the result, it is stabilized and the gasket seal of a variant cross section can be supplied.

[0041] Furthermore, the gasket which has the operation effectiveness in each above-mentioned claim in the gasket by claim 4 of this invention equipped with the above-mentioned configuration, i.e., reaction force, is comparatively small, there is little dispersion in reaction force, and the gasket product excellent in endurance and seal nature can be offered again.

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[Translation done.]

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## TECHNICAL FIELD

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[Field of the Invention] This invention relates to the gasket which is a kind of a sealing device, and relates to the gasket especially manufactured using a dispenser system, and its manufacture approach.

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[Translation done.]

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## PRIOR ART

[Description of the Prior Art] Although it has been thought till today that the gasket manufactured by the dispenser system is generally a simple gasket, it is observed from that the manufacture is easy and a manufacturing cost being cheap, and, recently, the interest has been increasing with amplification of a function.
[0003] Here, if the outline structure of the gasket 51 manufactured by this dispenser system is shown in drawing 18 (A) as a conventional example, by applying a liquefied gasket seal molding material to whole surface 52a of the gasket substrate 52 as a field for spreading, the gasket 51 is fabricated and let the cross-section configuration of the gasket seal 53 after shaping be an abbreviation semicircle.
[0004] Moreover, as the needle 56 in the conventional dispenser system 55 is shown in drawing 19 (A) and (B), the head opening configuration is circular and the point is made straight [ angle-of-sweepback zero ], and as the control direction of the dispenser system 55, i.e., the actuation direction of a needle 56, is shown in drawing 20 , it considers only as the parallel direction to field 22for spreading a, and the direction of a right angle (X-Y-Z direction).
[0005] However, it sets to the gasket 51 manufactured by this conventional dispenser system 55. Since it becomes what the cross-section configuration of the gasket seal 53 after shaping set the height to h, set the maximum width to w, and was limited to h/w<1, considering the above-mentioned head opening configuration of a needle 56 etc. ** From the die length of the base of the gasket seal 53 becoming long, and the width of face becoming large, when the height to partner material is comparatively high If the height is made high in order to raise the endurance of the ** gasket seal 53 with which the amount of the molding material which constraint arises in the location of the gasket seal 53 which can be fabricated, and is needed for shaping of the gasket seal 53 increases On the occasion of the nest of a gasket 51, gasket reaction force becomes high in first stage. Depending on the case In the part in which the flat-surface configuration of the ** gasket seal 53 which may deform the gasket substrate 52 according to the gasket reaction force which became high too much is curved or crooked, since die length differs by the inner circumference and periphery side As an approach of a cross-section configuration tending to become distorted, and there being inconvenience which said that the magnitude of gasket reaction force would change with flat-surface locations as the result, and avoiding such inconvenience ** Although the approach referred to as using a dispenser, fabricating base 53a to the 1st time, and fabricating up 53b to the 2nd time, namely, performing coating twice can be considered as shown in ** drawing 18 (B) which fabricates the gasket seal 53 by options, such as injection molding Neither of the approaches can start cost and the demand function in recent years cannot fully be satisfied.
[0006] It is related with the head configuration of a needle until now. Moreover, besides a circular cross section and a straight nozzle Although what made the needle bore tapering off (refer to JP,62-258776,A or JP,9-239976,A), the thing (refer to JP,7-318747,A) which prepared the include angle at the head of a needle are developed In case these conventional techniques carry out dispenser spreading of the liquid (3 - 300cpoise) of hypoviscosity comparatively, they are proposed for plugging prevention of a needle, or stabilization of coverage, and they do not set the cross-section configuration of the gasket seal after shaping to h/w>=1 like this

invention.

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[Translation done.]

## EFFECT OF THE INVENTION

[Effect of the Invention] This invention does the following effectiveness so.
[0038] Namely, it sets to the manufacture approach of the gasket by claim 1 of this invention equipped with the above-mentioned configuration. By setting the cross-section configuration of the gasket seal after shaping to h/w>=1 by making the opening configuration of the delivery of a needle into a variant cross section, using the maximum width as w using the height as h Since it is possible to set up the base of a gasket seal comparatively small even if it is the case that the height to the partner material of a gasket seal is comparatively high The amount of the gasket sealing material which can secure widely the location of a gasket seal which can be fabricated, and can extend the degree of freedom of the layout of a gasket seal, and is used can be stopped few. Moreover, since it is possible to make augend of gasket reaction force to the amount of gasket seal crushing smaller than before, it can prevent that a gasket substrate etc. deforms according to gasket reaction force. Moreover, since it is possible to set up widely the height tolerance of a gasket seal and clearance tolerance with the partner material after crushing, the stable seal engine performance is securable.
[0039] In addition to this, by setting the angle of sweepback of a predetermined include angle as a needle in the manufacture approach of the gasket by claim 2 of this invention equipped with the above-mentioned configuration, the needle in above-mentioned claim 1 can be used effectively, as the result, it is stabilized and the gasket seal of a variant cross section can be supplied again.
[0040] Moreover, in the manufacture approach of the gasket by claim 3 of this invention equipped with the above-mentioned configuration, not only by making it move in a parallel direction and the direction of a right angle but by carrying out revolution actuation of the needle a core [ the medial-axis line ] to the field for spreading, the needle in above-mentioned claims 1 or 2 can be used effectively, as the result, it is stabilized and the gasket seal of a variant cross section can be supplied.
[0041] Furthermore, the gasket which has the operation effectiveness in each above-mentioned claim in the gasket by claim 4 of this invention equipped with the above-mentioned configuration, i.e., reaction force, is comparatively small, there is little dispersion in reaction force, and the gasket product excellent in endurance and seal nature can be offered again.

[Translation done.]

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TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] In the approach of manufacturing a gasket in view of the point of a more than [ this invention ] using a dispenser system Even if it is the case that the height to partner material is comparatively high, while it is possible to be able to set up the base of a gasket seal comparatively small, to have it, and to secure widely the location of a gasket seal which can be fabricated The manufacture approach [ it is possible to stop the amount of the gasket seal molding material used few, and it is possible to suppress gasket reaction force small, and ] of a gasket which can stop that gasket reaction force varies greatly with a location further, It aims at offering the gasket manufactured by this approach.

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MEANS

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[Means for Solving the Problem] In order to attain the above-mentioned object, the manufacture approach of the gasket by claim 1 of this invention By being the approach of manufacturing a gasket by applying a gasket seal molding material to the field for spreading using the dispenser system equipped with the needle, and making the opening configuration of the delivery of said needle into a variant cross section It is characterized by setting the cross-section configuration of the gasket seal after shaping to h/w>=1, using the maximum width as w using the height as h.
[0009] Moreover, the manufacture approach of the gasket by claim 2 of this invention is characterized by using what set the angle of sweepback as the needle in the manufacture approach of the above-mentioned gasket of claim 1.
[0010] Moreover, in the manufacture approach of the above-mentioned gasket of claims 1 or 2, the manufacture approach of the gasket by claim 3 of this invention is characterized by using what carries out revolution actuation a core [ the medial axis ] while it moves in a parallel direction and the direction of a right angle to the field for spreading at a needle.
[0011] Moreover, the gasket by claim 4 of this invention It is the gasket manufactured by applying a gasket seal molding material to the field for spreading using the dispenser system equipped with the needle. It is characterized by setting the cross-section configuration of the gasket seal after shaping to h/w>=1, having used that maximum width as w having used that height as h, and the manufacture approach of above-mentioned claim 1 thru/or each item of 3 is invented that the gasket of this claim 4 should be manufactured.
[0012]
[Embodiment of the Invention] The example of this invention is explained below.
[0013] In order to solve the trouble in the above-mentioned conventional technique, it is suitable to perform as follows the manufacture approach of a gasket and the dispenser structure of a system with which the operation is presented.
[0014] The first example ... Namely, first, as shown in the first place at drawing 1 (A) and (B) The head configuration of the needle 2 in the dispenser system 1 is made into a variant cross section. The cross-section configuration of the gasket seal 23 which applies to whole surface 22a of the gasket substrate 22 as a field for spreading, and it is made to harden using the needle 2 of this variant cross section is made to be set to h/w>=1 as shown in drawing 2 (A), using that maximum width as w using that height as h.
[0015] It says that a variant cross section does not have a circular cross-section configuration, and it is [ ellipse / (or configuration of one of the two which halved the ellipse to the longitudinal direction) / a triangle, a square, a trapezoid, an ellipse form (or configuration of one of the two which halved the ellipse form to the longitudinal direction), or ] un-circular. making the head configuration of a needle 2 into a variant cross section it says supposing that it is un-circular (it had the longitudinal direction -- un-circular), without making circular the head opening configuration of a needle 2, i.e., the opening configuration of delivery 2b in apical surface 2a of a needle 2, (inner hull configuration of apical surface 2a) also including the outline configuration of apical surface 2a, when required.
[0016] In the illustrated example, as shown in drawing 1 (B), the opening configuration of delivery 2b in apical surface 2a of a needle 2 It considers as the configuration (outline isosceles triangle)

which combined the trapezoid and triangle from which the ratio of height h' to die-length w' of the base is set to about 1.5. Although it changes somewhat with the construction material or the degrees of hardness of the gasket seal 23 to apply, as shown in drawing 2 (A) The cross-section configuration of the gasket seal 23 before assembly with the partner material 24 similarly It considers as the configuration which combined the trapezoid and triangle from which the ratio of height h to die-length w of the base is set to about 1.5. As shown in drawing 2 (B), when making it the ratio of the height to the die length of the base set to about 1-1.2, the cross-section configuration of the gasket seal 23 after assembly with the partner material 24 (after crushing) The seal nature stabilized in the range of relative pressure 0-0.5MPa is securable.

[0017] Moreover, since it is possible to set up the base of the gasket seal 23 comparatively small even if it is the case that the height to the ** partner material 24 is comparatively high, by making the head configuration of a needle 2 into a variant cross section in this way The location of the gasket seal 23 which can be fabricated can be secured widely, and the degree of freedom of the layout of the gasket seal 23 can be extended. Moreover, as the amount of the molding material of the gasket seal 23 to be used is shown in the graphical representation of ** drawing 3 which can be stopped few Since it becomes smaller than the case where the augend of gasket reaction force to the amount of gasket seal crushing is the conventional technique Since it is possible to set up widely the height tolerance of the ** gasket seal 23 which can prevent that the gasket substrate 22 deforms according to gasket reaction force, and clearance tolerance with the partner material 24 after crushing The gasket 21 equipped with the cross-section configuration which does so the operation effectiveness which said that the stable seal engine performance was securable, and does such operation effectiveness so can be obtained by once coating of liquefied gasket seal molding material 23'.

[0018] In addition, the configuration of the needle 2 concerning this example makes the opening configuration of delivery 2b a variant cross section, making apical surface 2a of a needle 2 into a flat side without preparing a notch in point 2c of a needle 2.

[0019] Moreover, the second [ to the trouble in the above-mentioned conventional technique ] solution means gives the angle of sweepback alpha of predetermined magnitude to point 2c of the needle 2 in the dispenser system 1, as shown in drawing 1 (A).

[0020] And if the angle of sweepback alpha of a predetermined include angle is given to point 2c of a needle 2 in this way, this is enabled to use effectively the shape of needle dimorphism shown with the above-mentioned first solution means, as the result, it is stabilized and the gasket seal 23 of a variant cross section can be fabricated.

[0021] Moreover, not only making it move in a parallel direction and the direction of a right angle (X-Y-Z direction) but the third [ to the trouble in the above-mentioned conventional technique ] solution means enables revolution actuation of a needle 2 in the direction of theta focusing on the medial axis line 0 to whole surface 22a of the gasket substrate 22 which is a field for spreading, as show in drawing 4 .

[0022] and in this way , if not only make it move in a parallel direction and the direction of a right angle but revolution actuation of a needle 2 be enable focusing on the medial axis line 0 to whole surface 22a of the gasket substrate 22 , it become possible to use effectively the shape of needle dimorphism showed with the above-mentioned first solution means , and as the result , it be stabilize and the gasket seal 23 of a variant cross section can be fabricate . That is, in the flat-surface layout of the gasket seal 23, although a cross-section configuration tends to become distorted in the curve and flection since die length differs on the inner circumference and the periphery of a rubber seal, according to this invention, generating of configuration unevenness can be suppressed rather than the case of the conventional technique, and it can stop that gasket reaction force varies with a location by this.

[0023] In addition, in order to carry out revolution actuation of the needle 2 a core [ the medial-axis line 0 ], the running torque of revolution driving sources, such as a motor, is transmitted to a needle 2 through means of torque transmission, such as a belt.

[0024] Moreover, you may make it control of each X [ these ], Y and Z, and the direction of theta move both to relativity by moving both, respectively that what is necessary is just to move both to relativity by moving either the table (not shown) which carried the gasket substrate 22

which is a field for spreading or the needles 2.
[0025] Moreover, in the example concerned, although the viscosity of a gasket sealing material assumes about 2000 to 50000 poise, the range may be like 500 - 50000poise.
[0026] The second example ... the fourth [ to the trouble in the above-mentioned conventional technique ] solution means As shown in drawing 5 (A), (B), and (C), the opening configuration of delivery 2b of a needle 2 is made into a variant cross section by forming a notch 3 in point 2c of the needle 2 in the dispenser system 1. The cross-section configuration of the gasket seal 23 which applies to whole surface 22a of the gasket substrate 22 as a field for spreading, and it is made to harden using the needle 2 equipped with delivery 2b of this variant cross section is made to be set to h/w>=1 as shown in drawing 6 , using that maximum width as w using that height as h.
[0027] As opposed to the needle 2 of the shape of a cylindrical shape whose d is the inside diameter ofphi1.45mm in the illustrated example By being prepared so that the notch 3 whose width of face w1 is 1.34mm and whose height h1 is 2.9mm may leave a part of apical surface 2a of an axial right angle and may cut point 2b aslant, and forming such a notch 3 By accommodation of the coating pressure force, the rest (after) can manufacture the gasket 1 with which are satisfied of h/w>=1. And by forming a notch 3 in point 2b of a needle 2, and making the head opening configuration of a needle 2 into a variant cross section in this way ** Since it is possible to set up the base of the gasket seal 23 comparatively small even if it is the case that the height to partner material (not shown) is comparatively high The location of the gasket seal 23 which can be fabricated can be secured widely, and the degree of freedom of the layout of the gasket seal 23 can be extended. Moreover, as the amount of the molding material of the gasket seal 23 to be used is shown in the graphical representation of ** drawing 7 which can be stopped few Since it becomes smaller than the case where the augend of gasket reaction force to the amount of gasket seal crushing is the conventional technique Since it is possible to set up widely the height tolerance of the ** gasket seal 23 which can prevent that the gasket substrate 22 deforms according to gasket reaction force, and clearance tolerance with the partner material 24 after crushing The gasket 21 equipped with the cross-section configuration which does so the operation effectiveness which said that the stable seal engine performance was securable, and does such operation effectiveness so can be obtained by once coating of liquefied gasket seal molding material 23'.
[0028] In addition, the notching configuration at needle 2 illustrated head is an example, and is suitably set up according to the spreading conditions of the configuration and needle 2 bore, and coating pressure force of an aim after the ingredient to apply and spreading.
[0029] Moreover, not only making it move in a parallel direction and the direction of a right angle (X-Y-Z direction) but the fifth [ to the trouble in the above-mentioned conventional technique ] solution means enables revolution actuation of a needle 2 in the direction of theta focusing on the medial axis line 0 to whole surface 22a of the gasket substrate 22 which is a field for spreading, as show in drawing 8 .
[0030] and in this way , if not only make it move in a parallel direction and the direction of a right angle but revolution actuation of a needle 2 be enable focusing on the medial axis line 0 to whole surface 22a of the gasket substrate 22 , it become possible to use effectively the shape of needle dimorphism showed with the above-mentioned fourth solution means , and as the result , it be stabilize and the gasket seal 23 of a variant cross section can be fabricate . That is, in the flat-surface layout of the gasket seal 23, although a cross-section configuration tends to become distorted in the curve and flection since die length differs on the inner circumference and the periphery of a rubber seal, according to this invention, generating of configuration unevenness can be suppressed rather than the case of the conventional technique, and it can stop that gasket reaction force varies with a location by this.
[0031] Generally, since a dispenser 1 is attached in the Z-axis (namely, theta revolving shaft) through a jig, program amendment of the part which hits the arm is not only needed, but the running torque for weight of a dispenser 1 is needed, and the theta directional-control approach leads to the increment in a motor or power consumption. Even if the Z-axis is pivotable 360 degrees or more, also when a dispenser 1 interferes in a robot's skeleton depending on the jig at

this time, and dispenser 1 configuration and it becomes impossible to be rotated only about 180 degrees, there is. Moreover, when a notch 3 is formed at the head of a needle 2 and a robot is made into six five axis controls like an industrial robot, a robot's cost will double [ about ] to this invention. As shown in drawing 9 or drawing 10 R> 0, carrying out a deer, the rotational structure of a dispenser 1 By considering as the structure of making the Z-axis stay 4 rotating the needle 2 which attached the dispenser body in installation and the Z-axis 5 ** Compaction of the programming time by simplification of an actuation program, and the improvement in accuracy, ** The increment in the load capacity of the part by the reduction in torque (low-capacity-izing) and miniaturization of a Z-axis actuation motor, ** the case where the configuration of the dispenser 1 by the ability to use movable angle of rotation of the Z-axis effectively and reduction of constraint of magnitude, and a ** 6 shaft robot are used -- comparing -- a robot body -- cost -- about -- the effectiveness referred to as being referred to as one half can be acquired.

[0032] Moreover, you may make it control of each X [ these ], Y and Z, and the direction of theta move both to relativity by moving both, respectively that what is necessary is just to move both to relativity by moving either the table (not shown) which carried the gasket substrate 22 which is a field for spreading or the needles 2.

[0033] In addition, in the example concerned, the viscosity of a gasket sealing material assumes about 500 to 50000 poise. As a gasket sealing material, for example, UV polyurethane, the silicone rubber made from Shin-etsu silicone (RTV rubber), silicone adhesives, etc. are suitable.

[0034] Moreover, in this invention, although shown in drawing 2 (A) or drawing 6 , others and various things can be considered in the cross-section configuration of the gasket seal 23, for example, the following can be mentioned to it.

[0035] ** As shown in drawing 11 , let the cross-section configuration of the gasket seal 23 be an abbreviation triangle.

** As shown in drawing 12 , let the cross-section configuration of the gasket seal 23 be an abbreviation square.

** As shown in drawing 13 , let the cross-section configuration of the gasket seal 23 be the abbreviation square which formed the upper bed section in the semicircle.

** As shown in drawing 14 , make the cross-section configuration of the gasket seal 23 into the abbreviation trapezoid which has arranged the long side in the soffit section.

** As shown in drawing 15 , make the cross-section configuration of the gasket seal 23 into the abbreviation trapezoid which has arranged the long side in the upper bed section.

** As shown in drawing 16 , make the cross-section configuration of the gasket seal 23 into an abbreviation pentagon.

** As shown in drawing 17 , make the cross-section configuration of the gasket seal 23 into the abbreviation ellipse form which cut the soffit section flat.

[0036] Although, as for the cross-section configuration of ** thru/or **, the maximum width w is set as that soffit section among the cross-section configurations of this ** thru/or **, the maximum width w will be set as parts other than the soffit section which the cross-section configuration of ** thru/or ** equipped with the predetermined width of face w1.

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[Translation done.]

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## DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] The front view of the needle with which is the important section front view of the dispenser system with which implementation of the manufacture approach of the gasket concerning the first example of this invention is presented, and this system is equipped, and (B) are the direction view enlarged drawings of A in this drawing (A), and (A) is the apical surface enlarged drawing of the above-mentioned needle.
[Drawing 2] For (A), (B) is the important section sectional view showing the condition after shaping of the gasket concerning this example, and the important section sectional view showing the condition after crushing of this gasket.
[Drawing 3] The graphical representation showing the amount of gasket seal crushing, and the relation of gasket reaction force
[Drawing 4] The actuation explanatory view of this dispenser system
[Drawing 5] For the important section front view of the needle with which is the important section side elevation of the dispenser system with which implementation of the manufacture approach of the gasket concerning the second example of this invention is presented, and this system is equipped, and (B), the important section side elevation of this needle and (c) are [ (A) ] the bottom view of this needle.
[Drawing 6] The important section sectional view showing the condition after shaping of the gasket concerning this example
[Drawing 7] The graphical representation showing the amount of gasket seal crushing, and the relation of gasket reaction force
[Drawing 8] The actuation explanatory view of this dispenser system
[Drawing 9] The sectional view showing an example of the rotational structure of this dispenser system
[Drawing 10] The sectional view showing other examples of the rotational structure of this dispenser system
[Drawing 11] The important section sectional view of the gasket concerning other examples of this invention
[Drawing 12] The important section sectional view of the gasket concerning other examples of this invention
[Drawing 13] The important section sectional view of the gasket concerning other examples of this invention
[Drawing 14] The important section sectional view of the gasket concerning other examples of this invention
[Drawing 15] The important section sectional view of the gasket concerning other examples of this invention
[Drawing 16] The important section sectional view of the gasket concerning other examples of this invention
[Drawing 17] The important section sectional view of the gasket concerning other examples of this invention
[Drawing 18] (A) And important section sectional view of the gasket which (B) requires for the

conventional example, respectively
[Drawing 19] The front view of the needle with which is the important section front view of the dispenser system concerning the conventional example, and this system is equipped, and (B) are the direction view enlarged drawings of B in this drawing (A), and (A) is the apical surface enlarged drawing of the above-mentioned needle.
[Drawing 20] The actuation explanatory view of this dispenser system
[Description of Notations]
1 Dispenser System
2 Needle
2a Apical surface
2b Delivery
2c Point
3 Notch
4 Z-axis Stay
5 Z-axis
21 Gasket
22 Gasket Substrate
22a Whole surface (field for spreading)
23 Gasket Seal
23' Gasket seal molding material
0 Medial-Axis Line

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[Brief Description of the Drawings]
[Drawing 1] The front view of the needle with which is the important section front view of the dispenser system with which implementation of the manufacture approach of the gasket concerning the first example of this invention is presented, and this system is equipped, and (B) are the direction view enlarged drawings of A in this drawing (A), and (A) is the apical surface enlarged drawing of the above-mentioned needle.
[Drawing 2] For (A), (B) is the important section sectional view showing the condition after shaping of the gasket concerning this example, and the important section sectional view showing the condition after crushing of this gasket.
[Drawing 3] The graphical representation showing the amount of gasket seal crushing, and the relation of gasket reaction force
[Drawing 4] The actuation explanatory view of this dispenser system
[Drawing 5] For the important section front view of the needle with which is the important section side elevation of the dispenser system with which implementation of the manufacture approach of the gasket concerning the second example of this invention is presented, and this system is equipped, and (B), the important section side elevation of this needle and (c) are [ (A) ] the bottom view of this needle.
[Drawing 6] The important section sectional view showing the condition after shaping of the gasket concerning this example
[Drawing 7] The graphical representation showing the amount of gasket seal crushing, and the relation of gasket reaction force
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[Drawing 10] The sectional view showing other examples of the rotational structure of this dispenser system
[Drawing 11] The important section sectional view of the gasket concerning other examples of this invention
[Drawing 12] The important section sectional view of the gasket concerning other examples of this invention
[Drawing 13] The important section sectional view of the gasket concerning other examples of this invention
[Drawing 14] The important section sectional view of the gasket concerning other examples of this invention
[Drawing 15] The important section sectional view of the gasket concerning other examples of this invention
[Drawing 16] The important section sectional view of the gasket concerning other examples of this invention
[Drawing 17] The important section sectional view of the gasket concerning other examples of this invention
[Drawing 18] (A) And important section sectional view of the gasket which (B) requires for the

conventional example, respectively
[Drawing 19] The front view of the needle with which is the important section front view of the dispenser system concerning the conventional example, and this system is equipped, and (B) are the direction view enlarged drawings of B in this drawing (A), and (A) is the apical surface enlarged drawing of the above-mentioned needle.
[Drawing 20] The actuation explanatory view of this dispenser system
[Description of Notations]
1 Dispenser System
2 Needle
2a Apical surface
2b Delivery
2c Point
3 Notch
4 Z-axis Stay
5 Z-axis
21 Gasket
22 Gasket Substrate
22a Whole surface (field for spreading)
23 Gasket Seal
23' Gasket seal molding material
0 Medial-Axis Line

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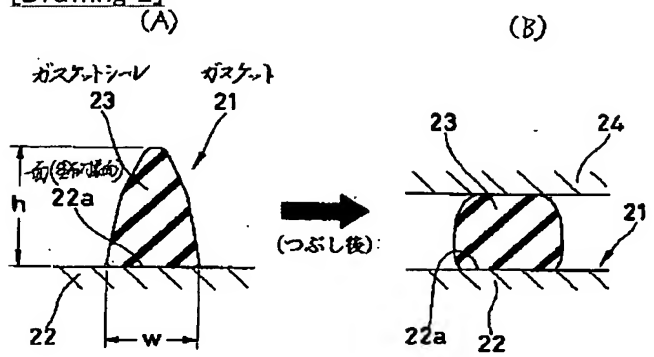
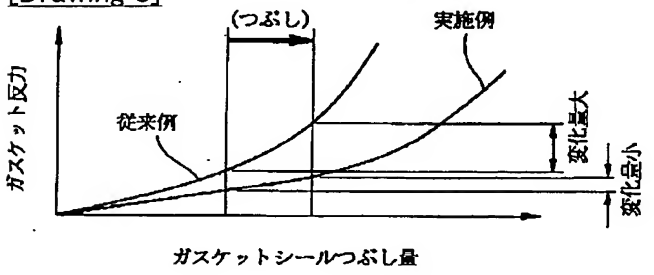
DRAWINGS

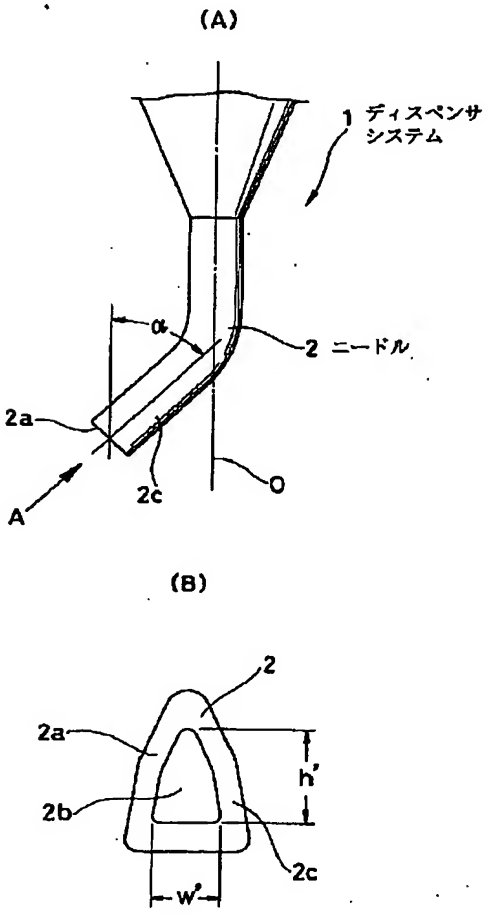
[Drawing 2]



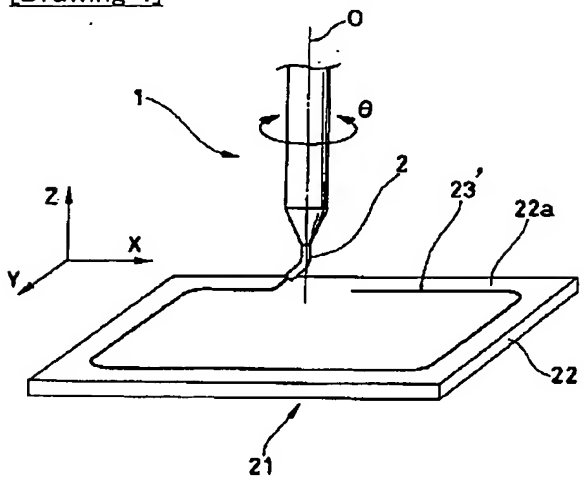

[Drawing 3]




[Drawing 1]




[Drawing 4]

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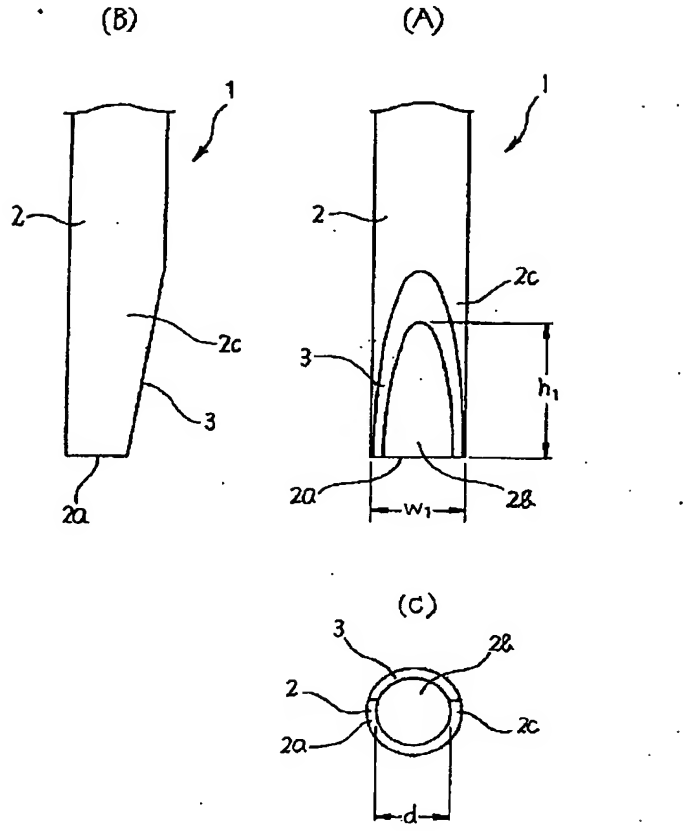


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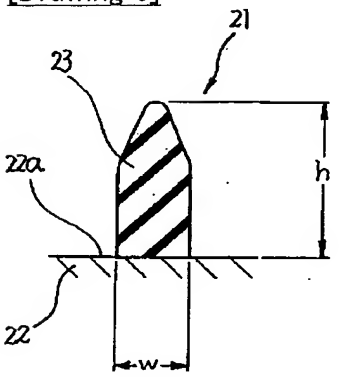


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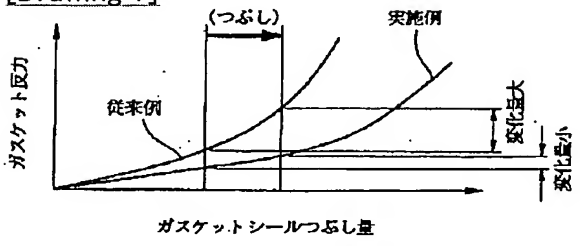


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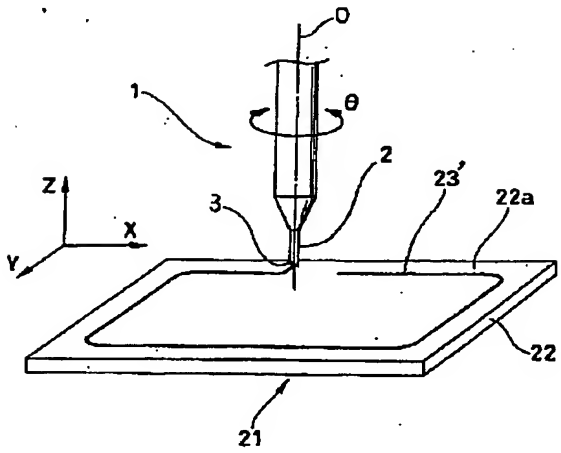


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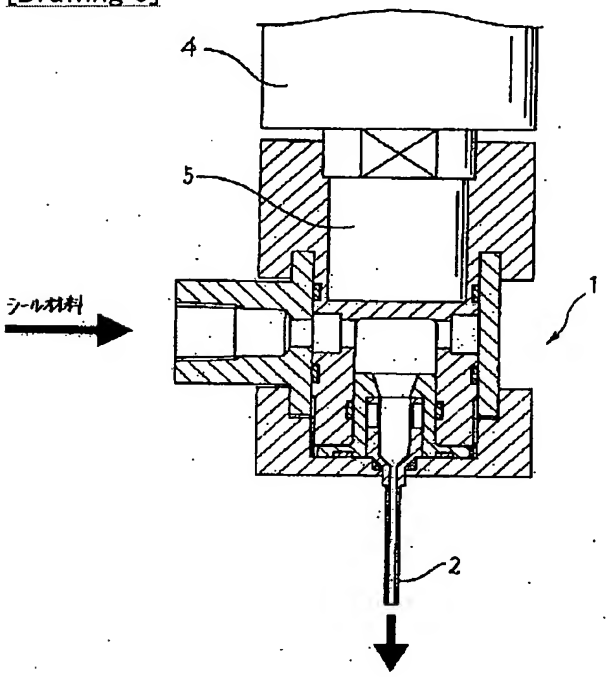


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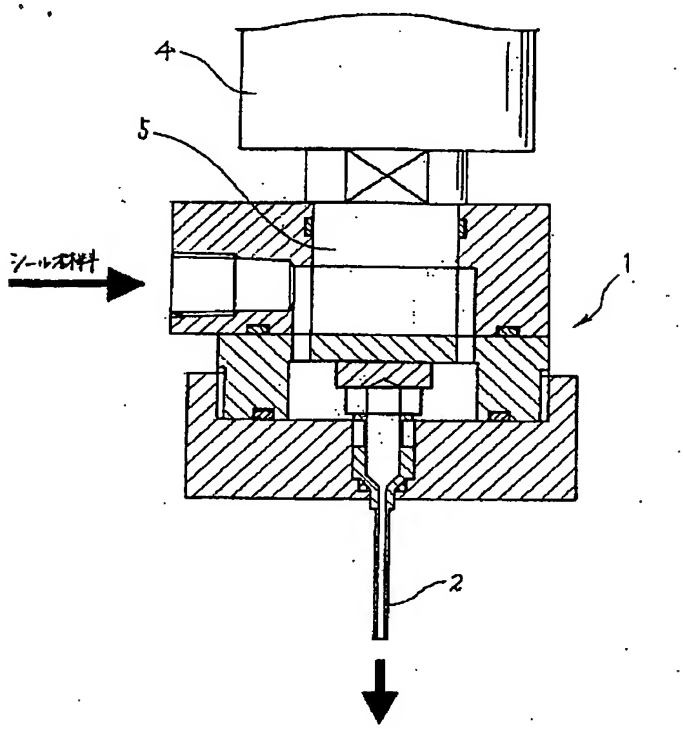


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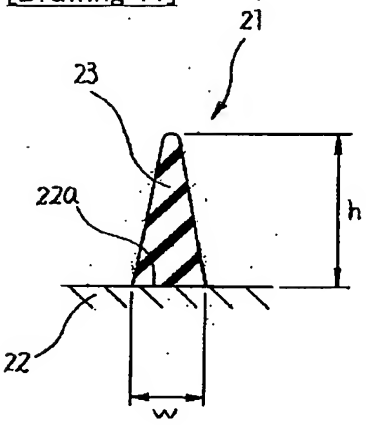
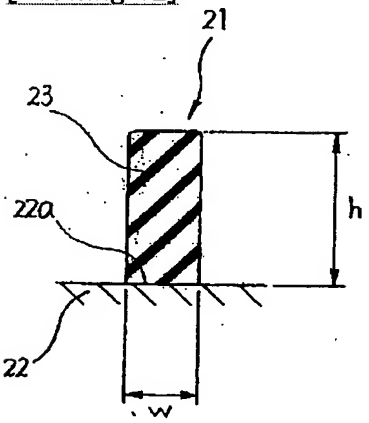



[Drawing 12]

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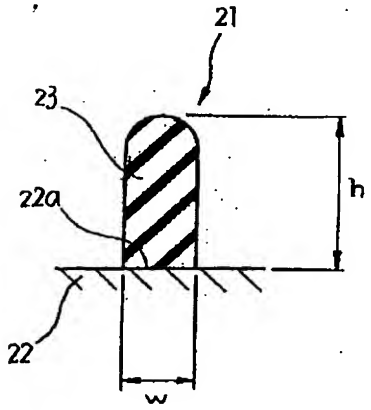
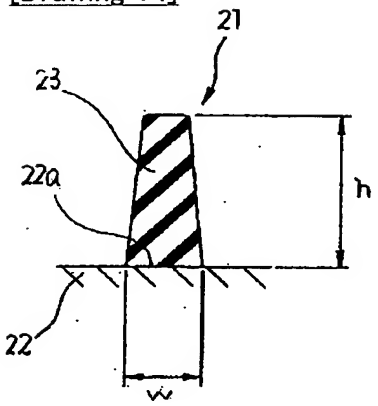
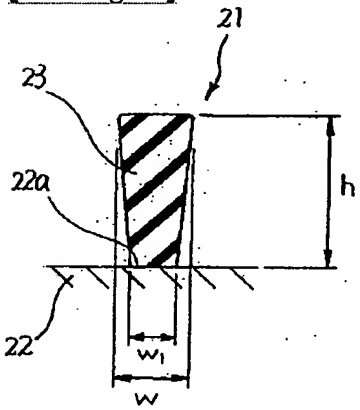


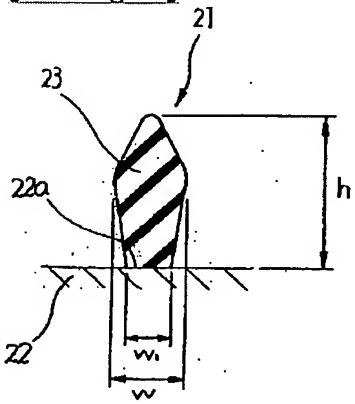

[Drawing 14]



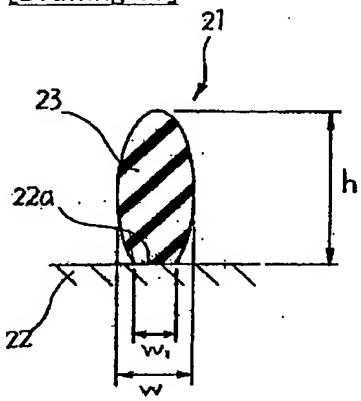

[Drawing 15]



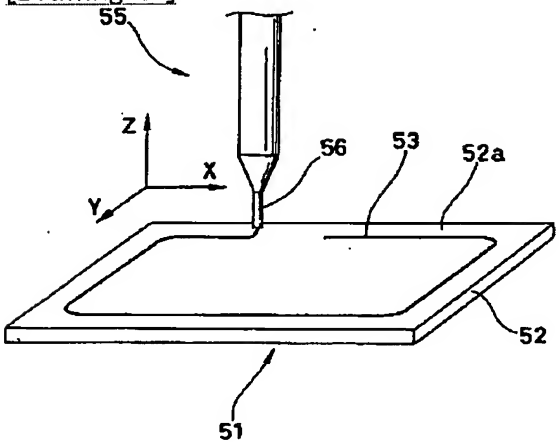

[Drawing 16]



[Drawing 17]

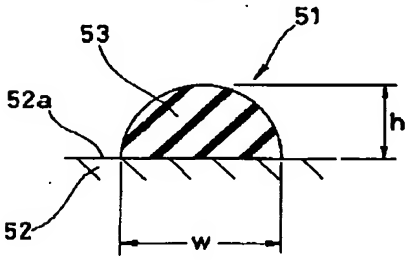



[Drawing 20]




[Drawing 18]

(A)

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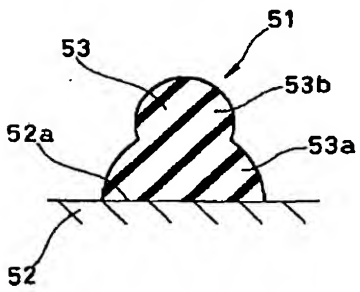
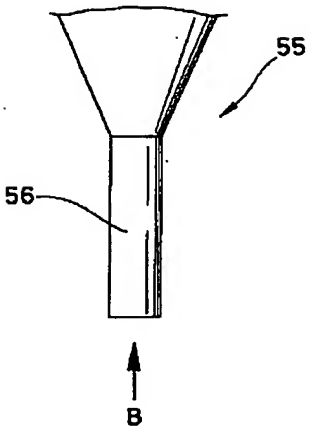



[Drawing 19]

(A)

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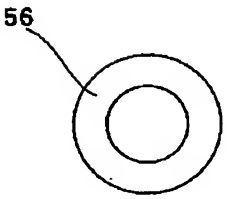


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[Translation done.]

* NOTICES *



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CORRECTION OR AMENDMENT

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[Kind of official gazette] Printing of amendment by the convention of 2 of Article 17 of Patent Law
[Category partition] The 2nd partition of the 5th category
[Publication date] May 9, Heisei 14 (2002. 5.9)

[Publication No.] JP,2001-182836,A (P2001-182836A)
[Date of Publication] July 6, Heisei 13 (2001. 7.6)
[Annual volume number] Open patent official report 13-1829
[Application number] Application for patent 2000-312078 (P2000-312078)
[The 7th edition of International Patent Classification]

F16J 15/10
B05C 5/02
11/10
B05D 1/26
3/00
C09K 3/10
F16J 15/14

[FI]

F16J 15/10 A
B05C 5/02
11/10
B05D 1/26 Z
3/00 D
C09K 3/10 R
F16J 15/14 C

[Procedure amendment]
[Filing Date] February 14, Heisei 14 (2002. 2.14)
[Procedure amendment 1]
[Document to be Amended] DRAWINGS
[Item(s) to be Amended] Complete diagram
[Method of Amendment] Modification
[Proposed Amendment]
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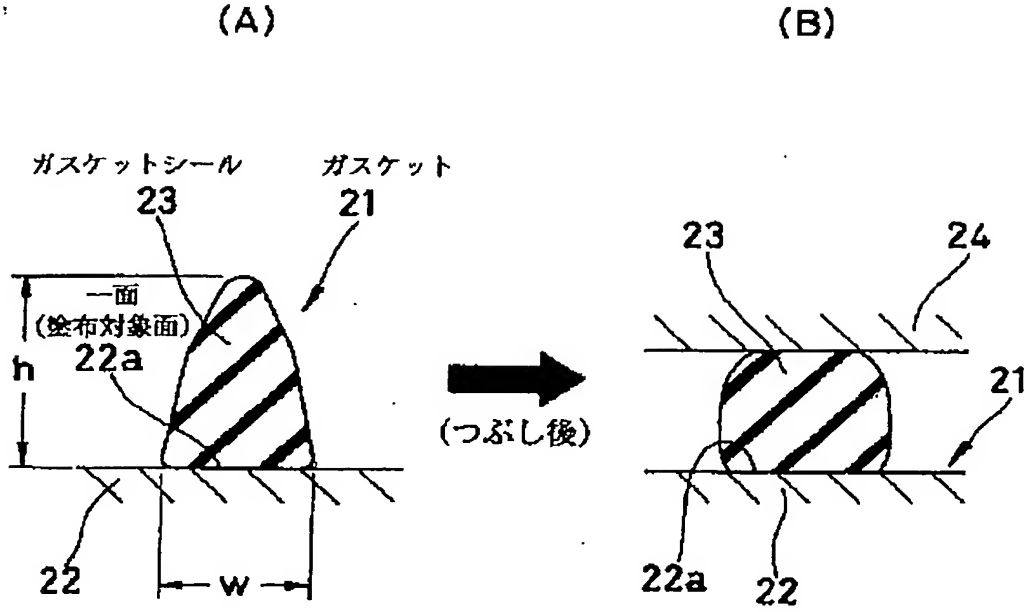


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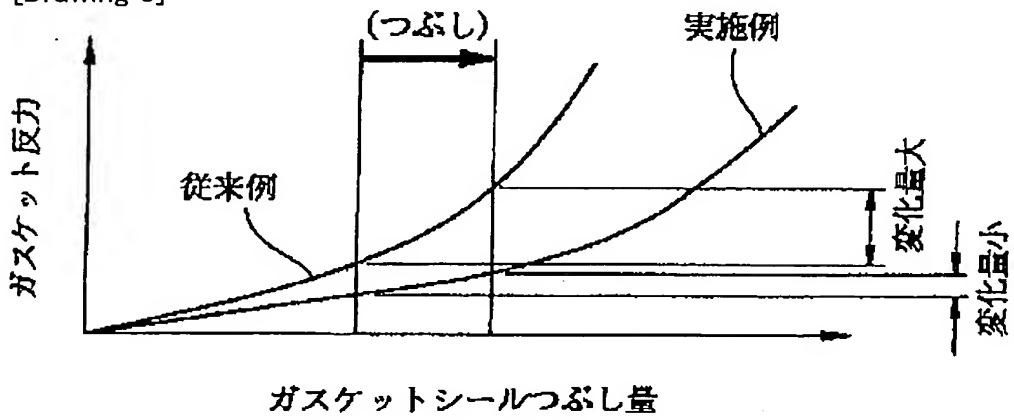
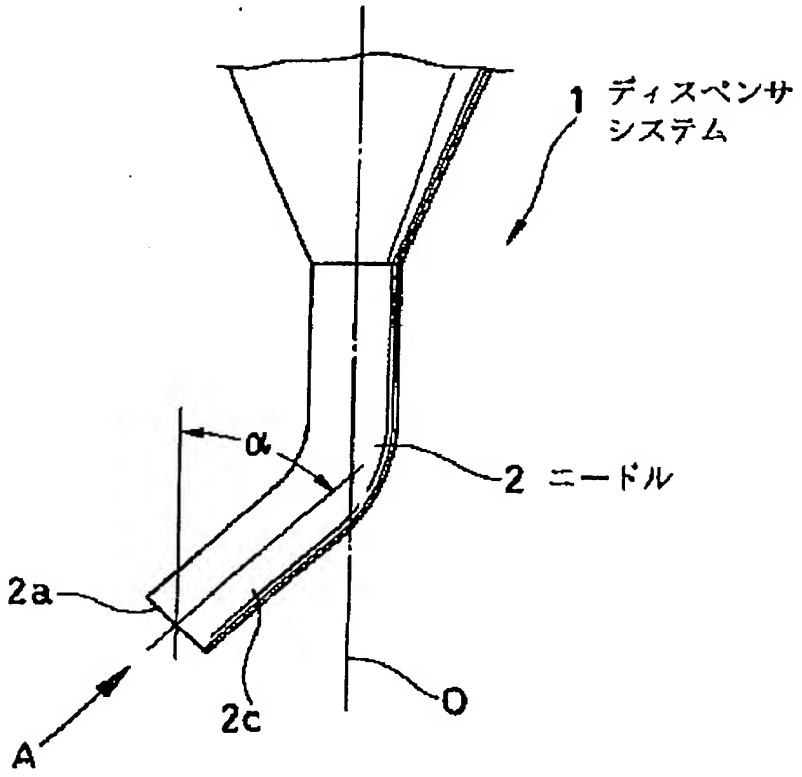



[Drawing 1]

(A)

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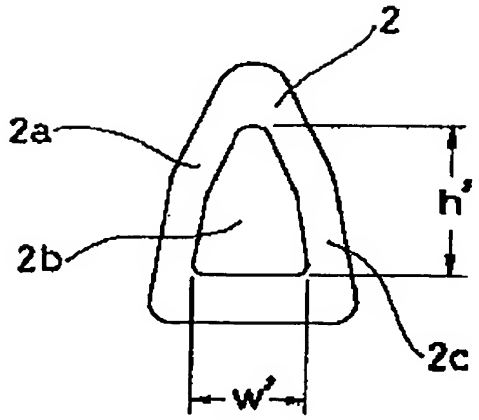
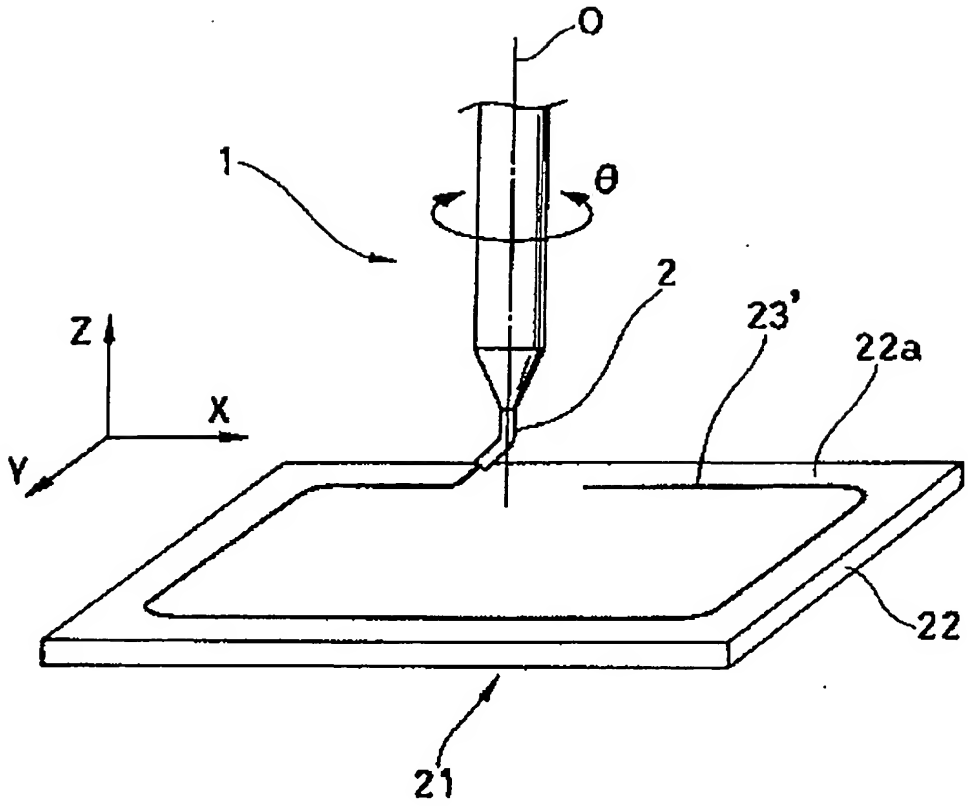
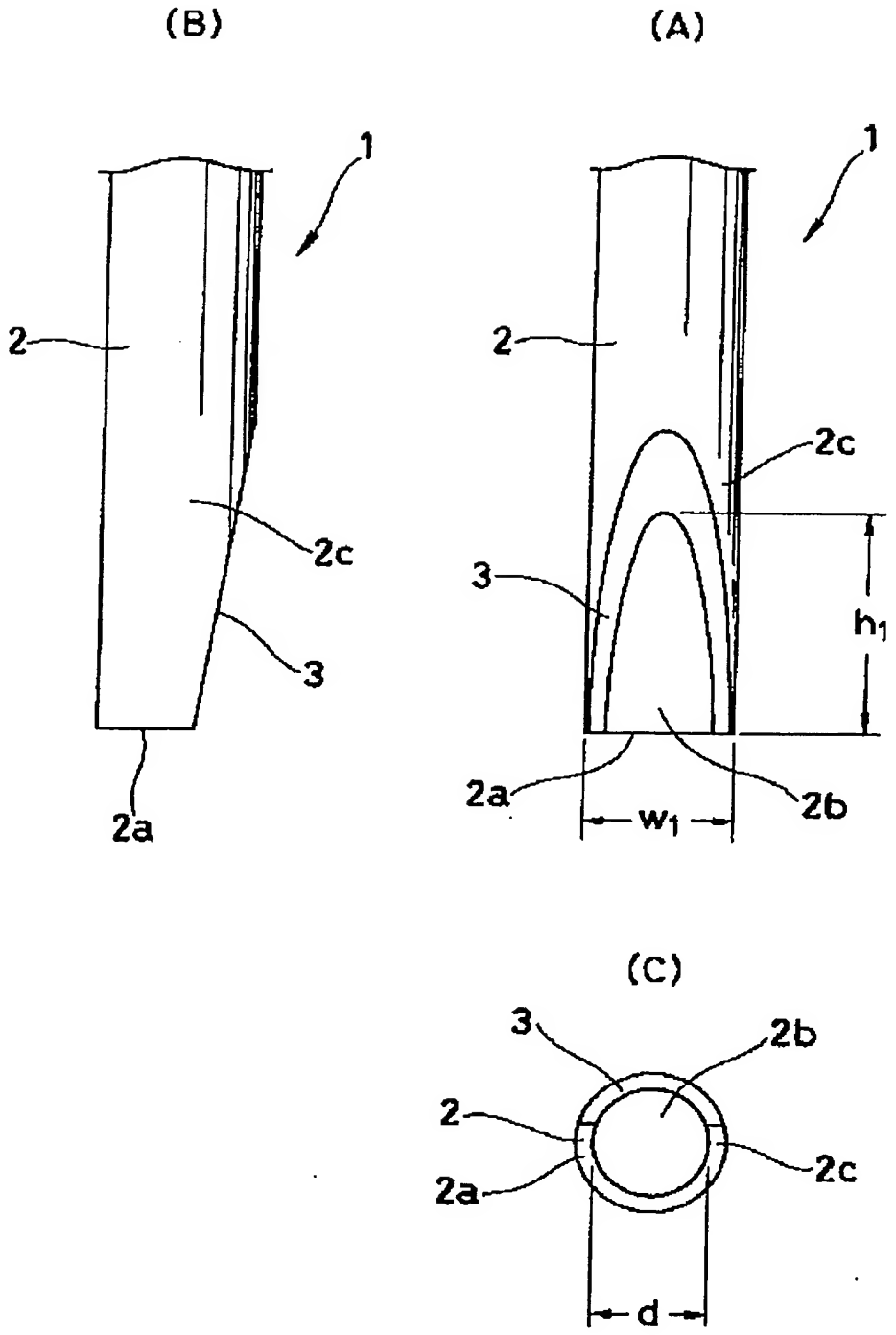


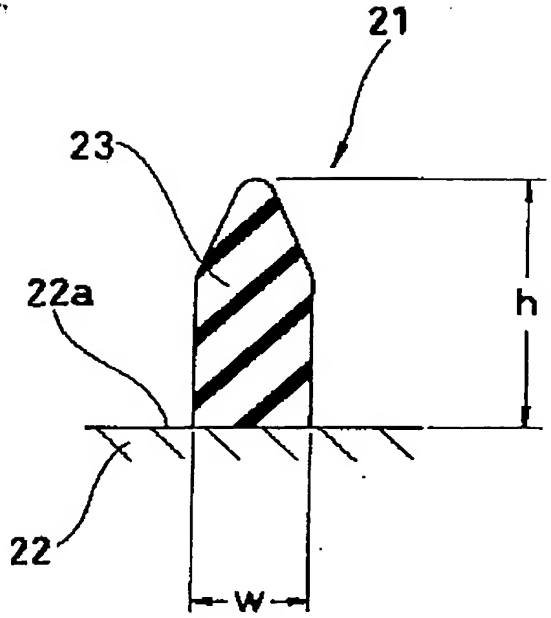

[Drawing 4]




[Drawing 5]




[Drawing 6]

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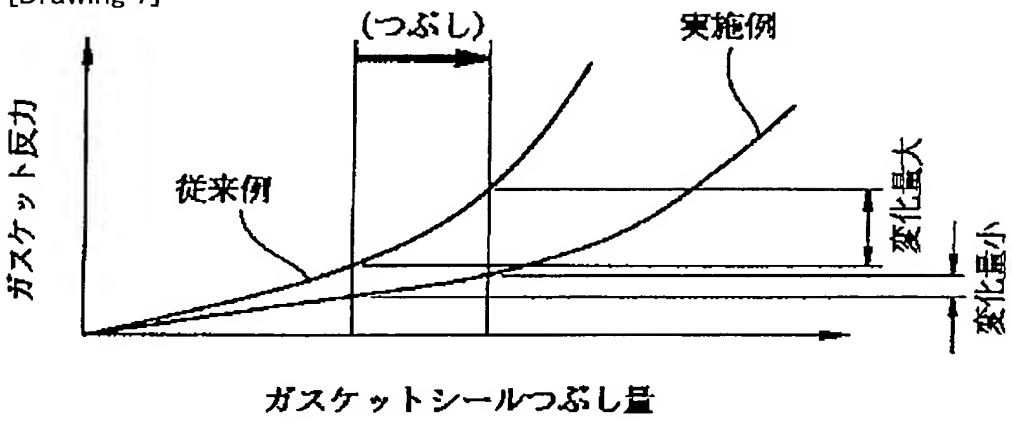
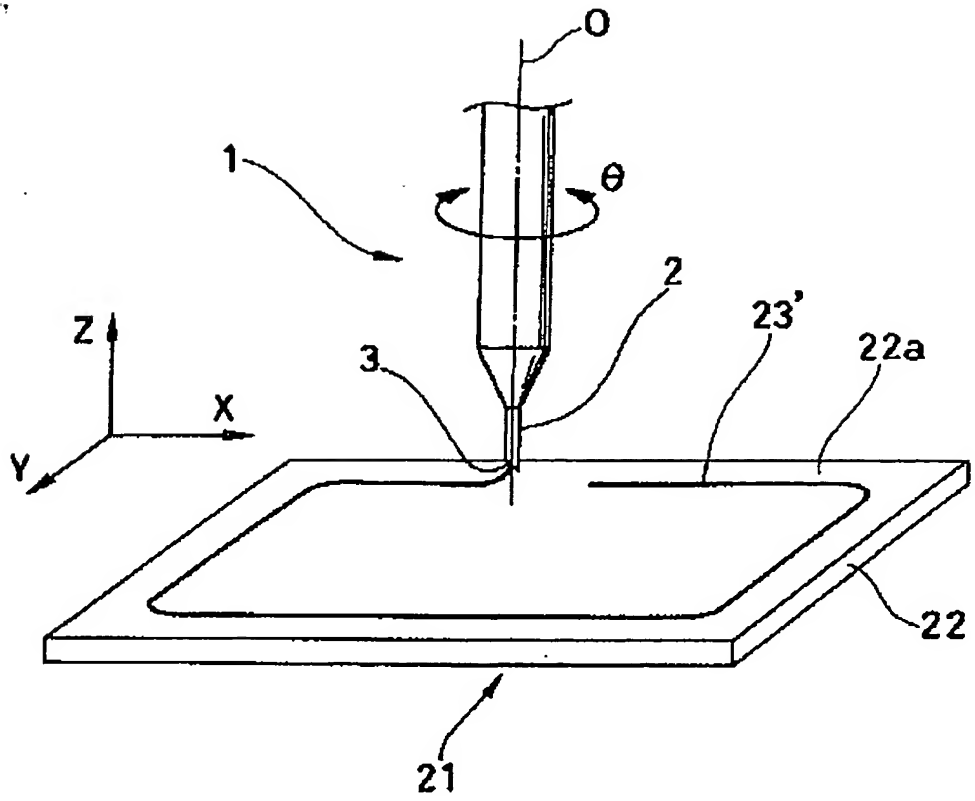
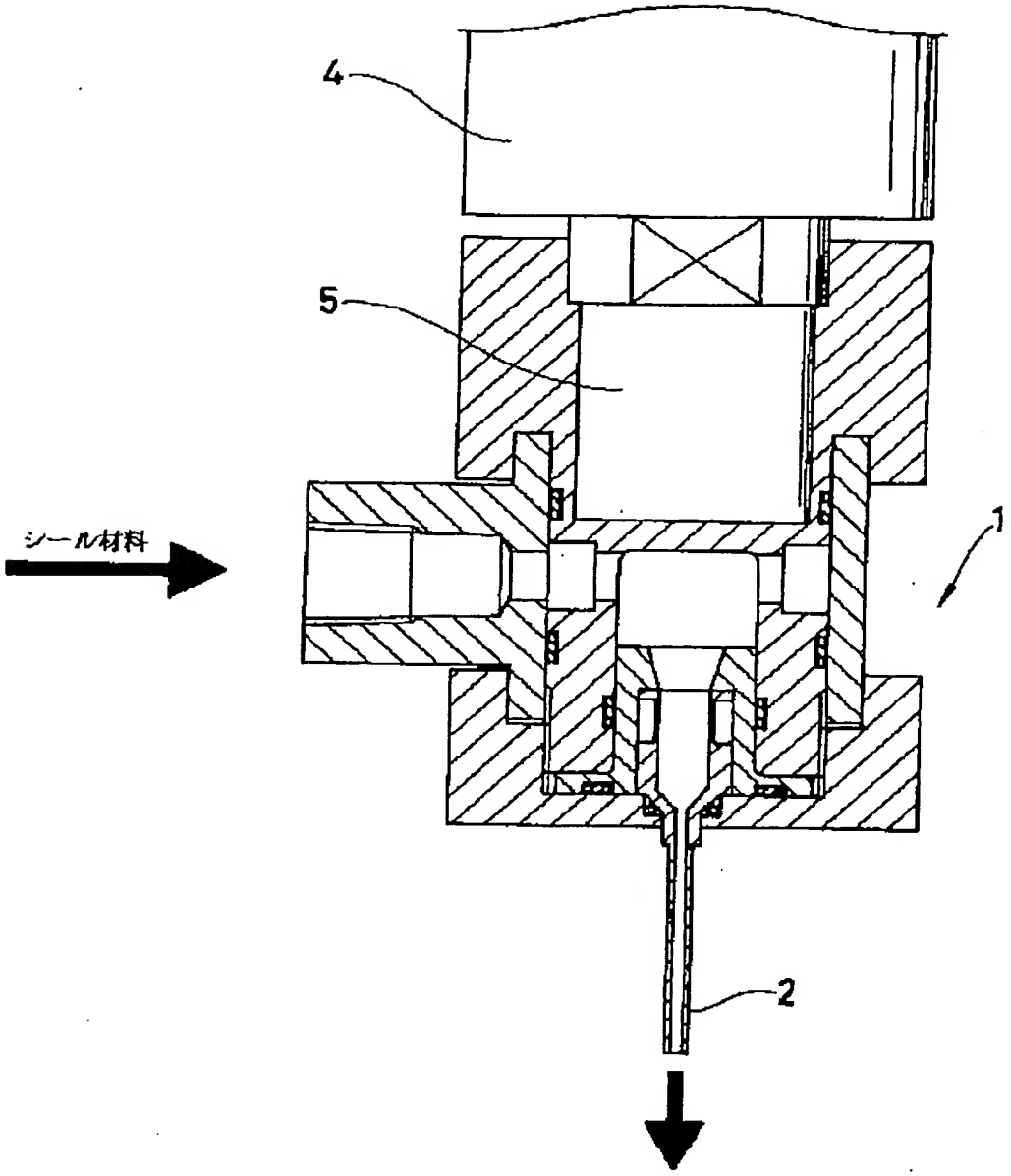


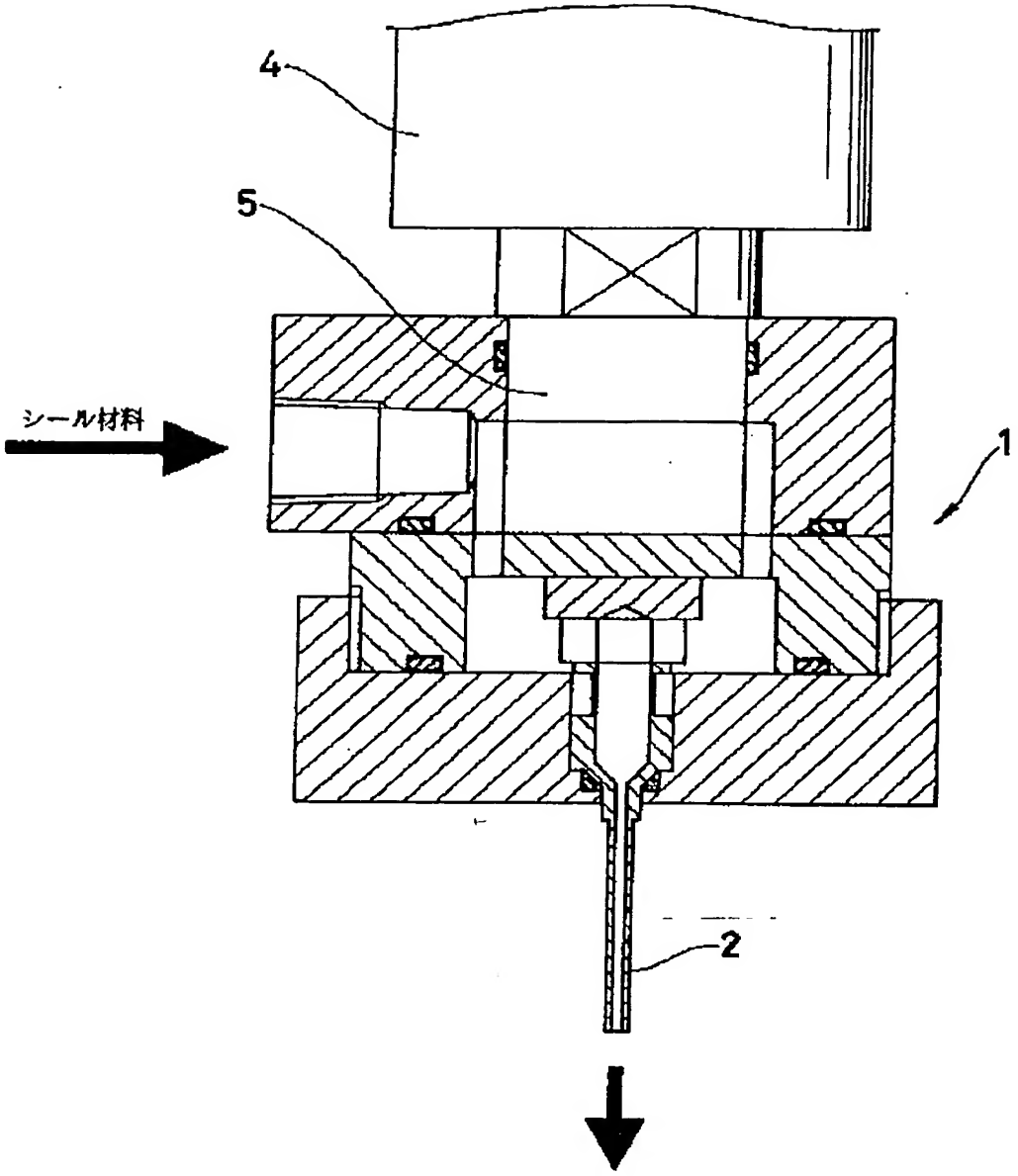

[Drawing 8]



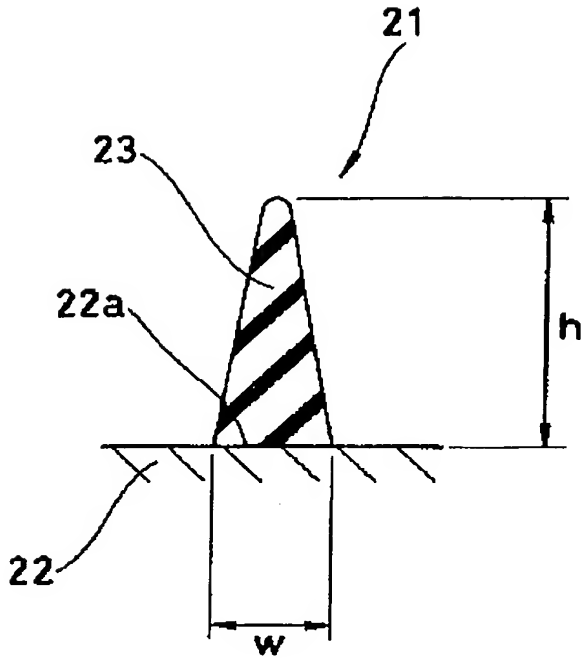

[Drawing 9]



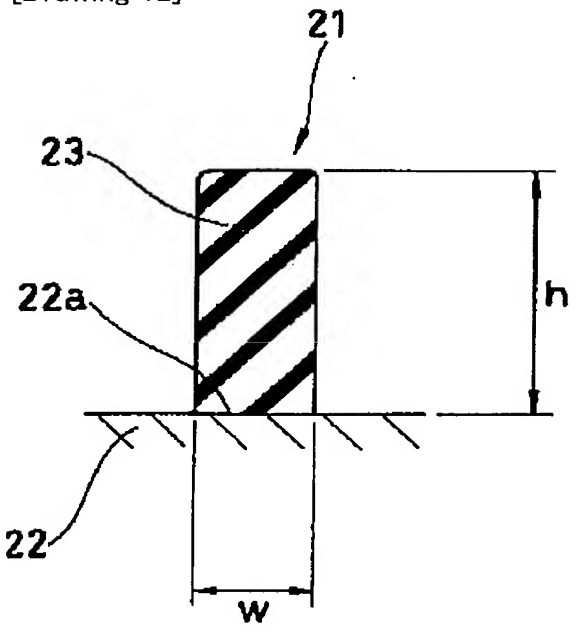

[Drawing 10]



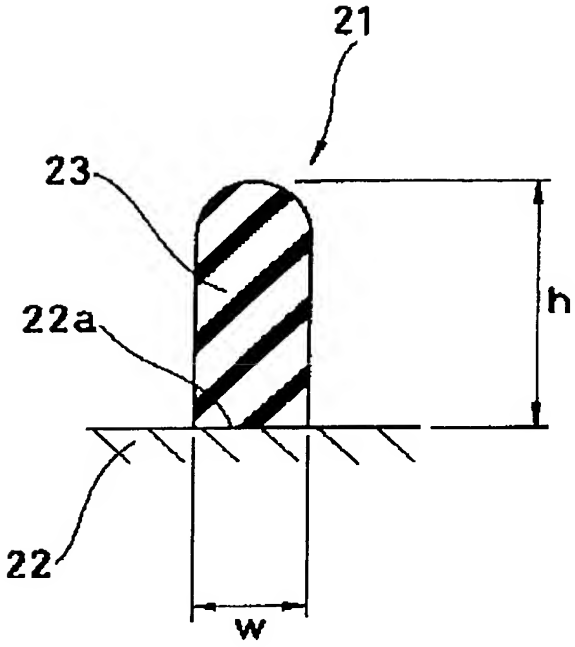

[Drawing 11]



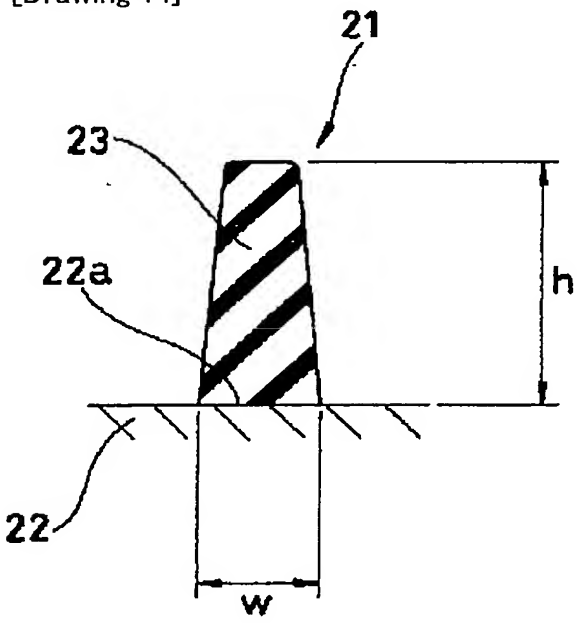

[Drawing 12]



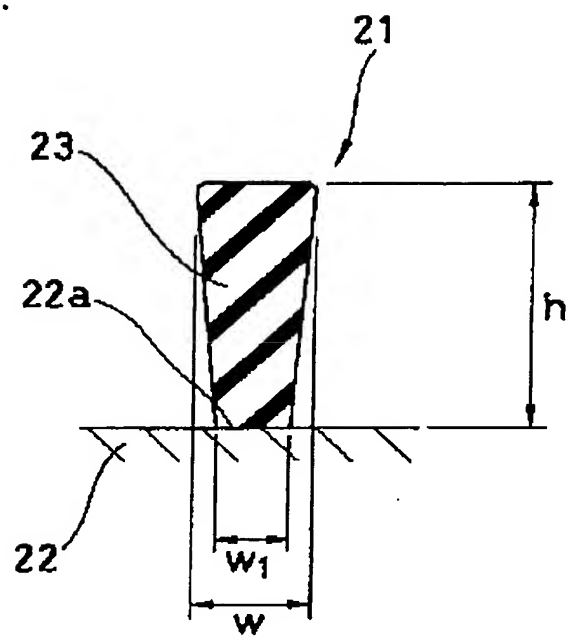

[Drawing 13]



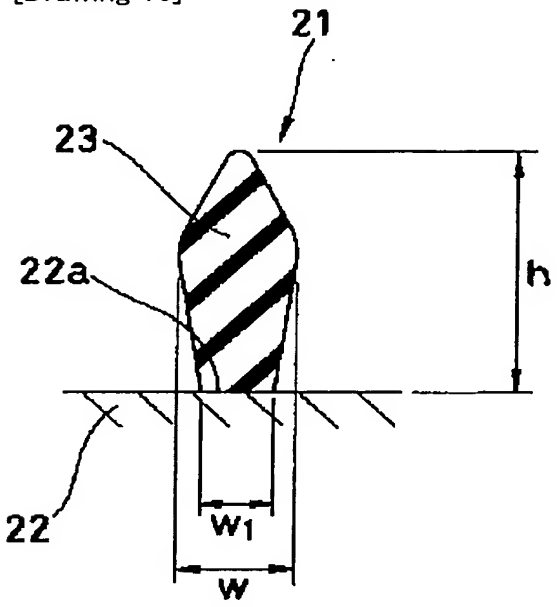

[Drawing 14]



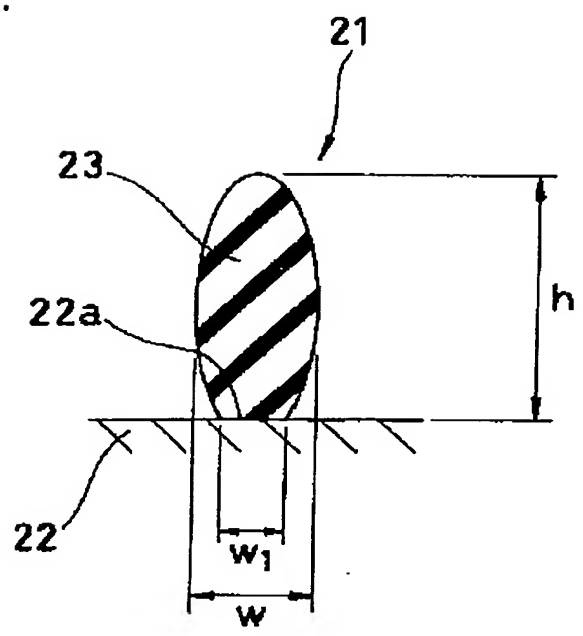

[Drawing 15]



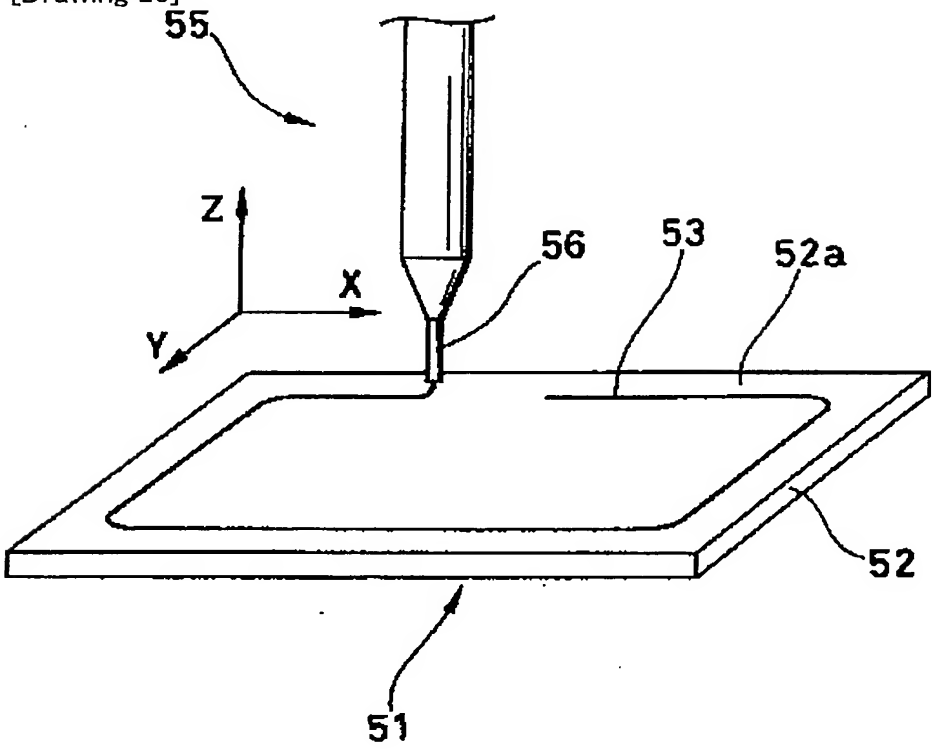

[Drawing 16]




[Drawing 17]

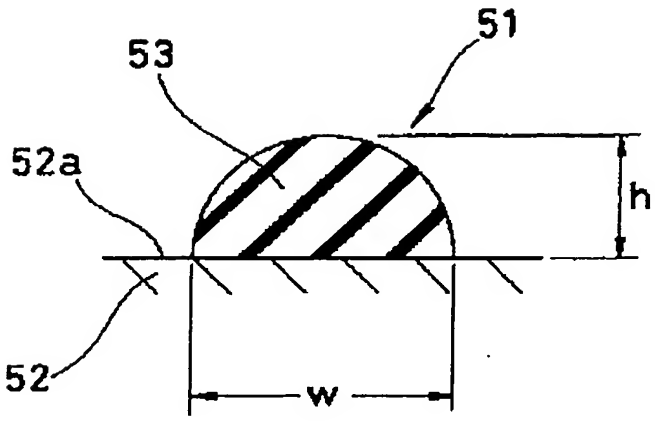



[Drawing 20]




[Drawing 18]

(A)

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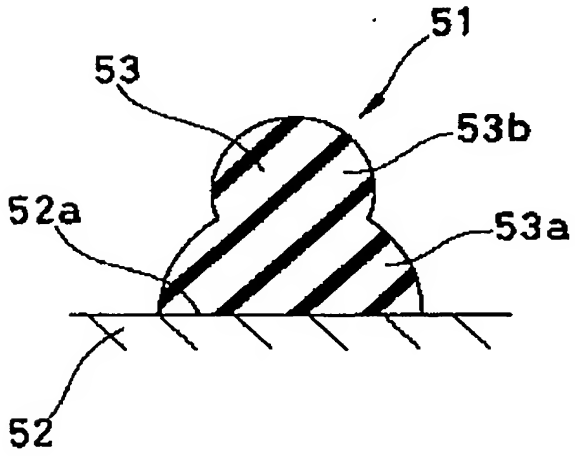
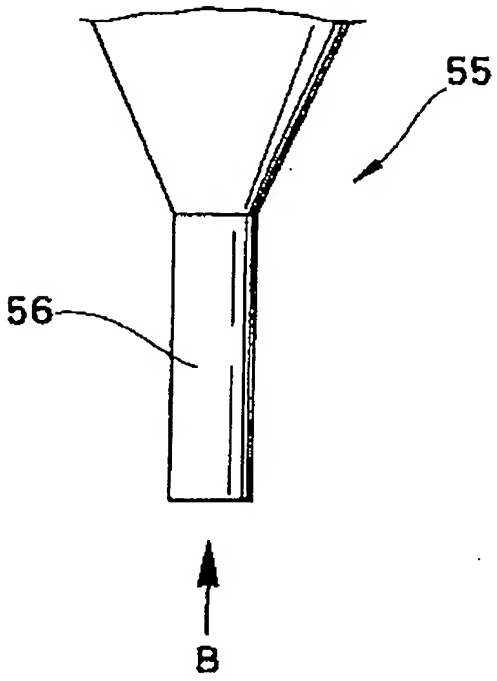



[Drawing 19]

(A)

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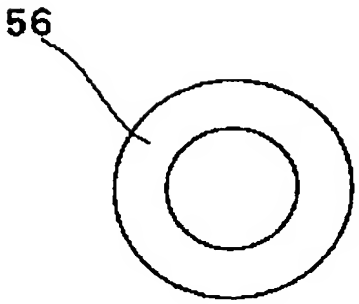


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[Translation done.]

* NOTICES *



1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

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CLAIMS

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[Claim(s)]
[Claim 1] It is the approach of manufacturing a gasket (21) by applying a gasket seal molding material (23') to the field for spreading (22a) using the dispenser system (1) equipped with the needle (2). The manufacture approach of the gasket characterized by setting the cross-section configuration of the gasket seal after shaping (23) to h/w>=1 by making the opening configuration of the delivery (2b) of said needle (2) into a variant cross section, using the maximum width as w using the height as h.
[Claim 2] The manufacture approach of the gasket characterized by using what set the angle of sweepback (alpha) as the needle (2) in the manufacture approach of the gasket of claim 1.
[Claim 3] The manufacture approach of the gasket characterized by using what carries out revolution actuation a core [ the medial axis (0) ] in the manufacture approach of the gasket of claims 1 or 2 while moving in a parallel direction and the direction of a right angle to the field for spreading (22a) at a needle (2).
[Claim 4] The gasket which is a gasket (21) manufactured by applying a gasket seal molding material (23') to the field for spreading (22a) using the dispenser system (1) equipped with the needle (2), and is characterized by setting the cross-section configuration of the gasket seal after shaping (23) to h/w>=1, having used the maximum width as w having used the height as h.

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[Translation done.]